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BY J. M. PURSER, M.D., DUBLIN

UNSOUNDNESS OF MIND, IN ITS LEGAL AND MEDICAL CONSIDERATIONS
BY J. W. HUME WILLIAMS, LONDON

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CONTENTS OF THE NEXT ISSUE.

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CONTENTS.

THE MODERN DIAGNOSIS OF DISEASES OF THE STOMACH.

By J. M. Purser, M.D., Dublin.

The Place of the Stomach in the Function of Digestion, . . 515
The Use of the Œsophageal Tube, ... 528
In Cancer, ... 535
In Chronic Ulcer, ... 538
In Catarrhal Inflammation, ... 540
In Dilatation, ... 543
In Nervous Dyspepsia, ... 546
In Secondary Disturbances of Digestion, ... 548

UNSOUNDNESS OF MIND, IN ITS LEGAL AND MEDICAL CONSIDERATIONS.

By J. W. Hume Williams, London.

CHAPTER I.

Legal and Medical Views Examined, ... 559

CHAPTER II.

Monomania, ... 588

CHAPTER III.

Moral Insanity, ... 638

CHAPTER IV.

Impulsive Insanity, ... 668

CHAPTER V.

Further Observations, ... 701

BALDNESS AND GRAYNESS; THEIR ETIOLOGY, PATHOLOGY, AND TREATMENT.

By Tom Robinson, M.D., London.

CHAPTER I.

PAGE
Anatomy of the Hair, ... 727
The Human Skin, ... 727
The Muscles of the Skin, ... 728

CHAPTER II.

Physiology of the Hair, ... 734
Growth and Development, ... 734

CHAPTER III.

Color and Texture of the Hair, ... 743

CHAPTER IV.

Alopecia, ... 752
Alopecia Præcox, ... 756
Alopecia Parasitica, ... 758
Tinea Favosa (Favus), ... 759
Tinea Tonsurans, ... 763
Alopecia Areata, ... 765
Sycosis, Mentagra, Chin-whelk, ... 768
Alopecia Somatica, ... 771
Syphilitic Alopecia, ... 772
Alopecia Follicularis, ... 773
Alopecia Universalis, ... 774

CHAPTER V.

Canities, Pilosis, Grayness or Hoariness of the Hair, . . . 778
Etiology of Canities, ... 778

CHAPTER VI.

Crinal Abnormities, ... 783
Plica Polonica and some other Affections of the Hair, . . 783
Expansions, Splitting of the Hairs, ... 783
Feather Disease, or Phagmesis of the Hair, ... 784
Ringed Hairs, ... 785
Cosmetics, ... 785
Hairdressers and Barbers of the Ancients, . . . 786
Hair Cosmetics, ... 787
Rules for the General Management of the Hair, . . 790

CHAPTER VII.

Treatment, ... 792

THE MODERN DIAGNOSIS

OF

DISEASES OF THE STOMACH.

BY

J. M. PURSER, M.D.,

DUBLIN.

IX - 34

THE MODERN DIAGNOSIS OF

DISEASES OF THE STOMACH.

While in former times physiologists assigned to the stomach very exaggerated powers, both mechanical and chemical, and while it was looked on as the principal organ of digestion, at present the tendency is rather to minimize its functions and to assign to it a place in the act of digestion inferior and subordinate to that attributed to the pancreas. Until the proteolytic action of the pancreatic secretion was proved by Corvisart, Bernard, Kühne, and others, we knew no place where proteids were digested except in the stomach; but now the universally-recognized power of the pancreas to digest albuminous substances seems to make the stomach a superfluous organ, or to reduce its functions merely to those of a receptacle in which the food is retained for a time and passed on into the intestine gradually, so as not to over-distend the narrow tube of the duodenum, or to too greatly overtax the power of the pancreas.

There is not wanting experimental evidence that life and health may be maintained in the complete absence of stomach digestion. The entire stomach, or all but a very small portion, has been removed from a dog, and the animal has recovered and lived in good health. Czerny has succeeded in keeping a dog for five and a half years after this formidable operation, and at the time when he was killed he was lively, voracious, able to eat and digest as well as other dogs, and the assimilation of his food and character of his fæces were in all respects normal.

In the human subject cases have been observed of persons whose gastric contents were constantly found free from both

hydrochloric acid and pepsin, in whom, nevertheless, digestion was fairly performed and the health was very good.

Very numerous experiments have been made on dogs into whose pylorus a fistula was established. The food was passed through this fistula into the duodenum, while the opening of the stomach was closed by an obturator. It was easy to keep these animals alive and in good health and nutrition, although the food was unacted on by the stomach, and digestion was exclusively intestinal. It was found that raw flesh was digested far more rapidly in the intestine than in the stomach. In one experiment there disappeared from the stomach in two hours 53 per cent, from the intestine 85.7 per cent, of the introduced nitrogen. Boiled eggs, rubbed up with salt solution, and boiled connective tissue, as skin, were well digested by the pancreas; while boiled flesh, raw connective tissue, and (curiously) finely-divided casein were not digested in the intestine, but caused diarrhœa and were soon expelled.[1]

It would appear, then, from these observations, as if the digestive function of the stomach was not indispensable; and, in view of this, another function has recently been assigned to the organ which is, it is maintained, far more important than that of digesting proteids. The prominence given by recent researches to the action of micro-organisms is very great, and we are familiar with the idea that the greater part of the struggle for existence consists in a continuous warfare with these bodies. We know that every article of food or drink we take swarms with them, and the question naturally arose, How are the worst forms of putrefaction prevented in our intestines? How do we exist for a day without infection from the various pathogenic organisms which must perpetually find their way down our œsophagus?

We know that micrococci and bacteria thrive badly or are killed in an acid medium, and it has been supposed that the stomach, by virtue of its acid secretion, serves as a guard at the upper end of the alimentary canal to arrest or kill off the swallowed germs, which, if allowed passage into the intestine, would there induce abnormal putrefactions or give rise to other abnormal conditions. This view has been brought forward in a most attractive way by Brieger,[2] who points out that the acidity of the gastric juice, as determined by Schmidt, Heidenhain, and Hoppe Seyler, is just of that degree which

has been found by the experiments of Sieber, Nencki, and Miquel to be effective in promoting the putrefaction of animal infusions.

That such a germicidal function is performed by the stomach there can be little doubt. Alapy[3] found that the organisms which cause traumatic infection, as streptococcus pyogenes, erysipelas coccus, and staphylococcus pyogenes aureus, were killed in their passage through the stomach of healthy rabbits, and could not be found in the intestine; while if the acidity of the gastric juice was diminished or neutralized, they passed without difficulty, and were found living in the entire intestinal tract.

MacFadyen,[4] however, found that the gastric juice did not exert such a destructive action on bacteria as is often stated. He experimented with nine kinds of organisms. All of these resisted four hours' action of HCl of 0.05 per cent. All except two—Koch's comma bacillus and the spirillum of Finkler and Prior—survived HCl of 0.1 per cent. Two only—staphylococcus aureus and the typhoid bacillus—withstood acid of 0.3 per cent, while all were killed by stronger acid.

Pepsin alone had no action, and, mixed with the acid, did not influence the results.

Spores are very resisting, and can easily resist the action of the gastric juice. Anthrax spores are killed by 2 per cent HCl only on the tenth day.

In experiments made on dogs who were fed with pure cultures of bacteria added to their food, it was found that the organisms could be got from the intestinal contents. Even such delicate organisms as B. anthracis and Koch's comma bacillus could, when given in water to fasting animals, pass through the stomach and be found living and capable of culture in the small intestine. The question is somewhat complicated by the fact that in the intestine the germs grow in an oxygen-free medium. This will explain why the number of germs which can be detected by the microscope is greater than those which can be cultivated from the intestinal contents. MacFadyen found that when he made his cultures anaërobically in an atmosphere of hydrogen the number of colonies was far greater than that got by ordinary methods.

Hueppe[5] has recently shown that when facultative anaërobic germs, as cholera bacillus, are grown in an atmosphere

free of oxygen their virulence is greatly increased—*i.e.*, they produce their toxin more energetically and rapidly than under ordinary circumstances, but their susceptibility to the action of external agencies is also increased, so that, in this condition, they are almost infallibly destroyed by the action of the gastric juice. When, however, they are grown for a time in an oxygenated atmosphere, they become more resistant, and may pass uninjured through the stomach and excite their specific fermentation in the intestine. By this discovery is explained why perfectly recent cholera dejections are less virulent than those which have been exposed for some time outside the body. Further, it explains the influence of external circumstances, as the condition of the subsoil water in the spread of the disease, and shows that in estimating the chances which a germ has of passing through the stomach safely we must consider not only the acidity of the gastric juice and the kind of organism, but also the condition of the latter at the time of its entrance into the system. Hueppe proposes as a remedy for cholera salol, a substance which passes through the stomach unchanged, but in the alkaline intestine is split into salicylic acid, which acts directly on the now susceptible anaërobic germs.

This very important question—how far the acidity of the stomach protects us from the entrance of living germs into the lower part of the intestine—has been studied indirectly. It is known that some of the products of intestinal putrefaction are absorbed from the bowel, and are excreted in the urine, in the case of the aromatic substances, as indol, skatol, phenol, conjugated with sulphuric acid in ethereal combinations. The quantity of these substances in the urine may be taken as a measure of intestinal putrefaction, and we all know the large quantities of indigo and phenol which may be got from the urine in cases of intestinal obstruction, peritonitis, and other conditions, where, owing to retention of matter in the bowel, the putrefactions advanced beyond their due limits. Wasbutzki[6] found in patients suffering from stomach diseases of different kinds that where in the stomach HCl is deficient and intense bacterial fermentation occurs, the proportion of conjugated sulphuric acid in the urine is increased; that in cases of intense yeasty fermentation where HCl is abundant the conjugated sulphuric acid is diminished. In two cases, although

HCl was absent, the conjugated sulphuric acid was diminished. Here, however, there was an abundant formation of organic acids, lactic and butyric, in the stomach, and these had the same antifermentative action as that usually exerted by the HCl. Indeed, MacFadyen has found that these acids have a marked effect in destroying bacteria.

Kost [7] experimented on men, and found that where with a constant diet alkalies were administered so as to make the urine alkaline, the conjugated sulphuric acid in the urine was constantly increased, which is attributable to the freer entrance of putrefactive germs into the intestine through the neutral or alkaline stomach.

Unfortunately as yet we are not acquainted with any substance in the urine from which we can conclude that pathogenic bacteria are present in the intestine. In a remarkable case of cystinuria, v. Udránzsky [8] and Baumann found in the urine, besides the cystin, constantly for more than a year, penta- and tetra-methylendiamins, which were shown to be identical with the ptomaïnes discovered by Brieger, and named by him cadaverine and putrescine. Since Brieger has shown that these bodies are found in certain putrefactions and in the cultures of certain bacteria, as cholera bacillus and Finkler and Prior's vibrio, attention was directed to the fæces in which also these ptomaïnes were found. Hitherto diamins have been found only in the urine of cases of cystinuria, and do not occur in the stools of healthy patients. Indeed, so far they have been found only in cystinuria and in the semen-smelling discharges of cholera patients. They are probably the products of the metabolism of special bacteria which exist in the intestine of cystin patients. Kost, alluding to this case, anticipates that we shall find in the urine in other abnormal states substances which will enable us to recognize the existence of various pathogenic bacteria in the intestine, and the occurrence of fermentation produced by them.

But while we must admit that the stomach, by its acidity, does serve an important purpose in guarding from bacteria the lower parts of the digestive tract, I believe there are few who will be ready to allow that this is its main function, or who will not hold this as secondary to the digestive action which it exerts in certain classes of foods.

That the secretions of the stomach are capable of dissolv-

ing many alimentary substances has been known since the experiments of Reamur and Stevens, who found that substances inclosed in perforated tubes soon disappeared when the tubes were introduced into the stomach either of animals or of men. That this was a purely chemical solution which could be effected outside the body was shown by Spallanzani, who first made experiments on artificial digestion with the gastric juice expressed from sponges which had been swallowed and again drawn up by attached strings from the stomach.

The entire subject of the chemical processes which are due to the action of the gastric juice has undergone an immense development of late years, and we now know that these are due to the agency of a substance—pepsin—belonging to the class of ferments or enzymes. This pepsin, however, will not act except in the presence of a free acid, and the secretion of the stomach in health is always acid. On the nature of this acid much uncertainty prevailed for a long time, but the fundamental observation of C. Schmidt set the question at rest. He found that, supposing all the bases present to be combined with chlorine, there was still a large excess of HCl, and that this excess required for its neutralization just that quantity of alkali necessary to neutralize the gastric juice itself. Thus he proved not only that free HCl was present, but that it was the only acid present. No doubt HCl is, except in most exceptional cases, the only acid secreted, but we shall see that in every act of digestion other acids are present whose appearance, disappearance, and relative proportion to the HCl are objects of great importance in the investigation of the digestive act as performed in the human stomach.

Although we speak of the stomach as a single glandular organ, and the gastric juice as a single secretion, yet really it is not so. The structure of the stomach differs in different parts, and so do the secretions. The pyloric part has long been known to differ from the rest, but until 1878 much uncertainty prevailed as to the exact nature of the secretion formed by each part. Heidenhain then isolated successfully the pyloric portion, leaving its blood-vessels and nerves intact. He joined the fundus to the duodenum, and made a sac of the isolated pylorus, attaching its edges to the wound in the abdomen, so that its secretion flowed out and could be collected. This operation had been performed before by Klemensiewicz, but his

dog lived only a few days. Heidenhain succeeded in keeping one dog alive for 12 days, when he had to be killed in consequence of stricture of the passage into the intestine. Another dog lived in good health for 10 weeks. The secretion from the pyloric region was alkaline, clear, viscid from the presence of much mucus, and contained pepsin in abundance, as shown by its powerful digestive action when made acid by HCl. It also contained the second gastric ferment—namely, rennet—for when added to fresh milk, without any addition of acid, it quickly caused curdling.

Heidenhain next performed the still more difficult operation of isolating a large piece of the fundus of the stomach, and converting it into a sac opening outward. Of dogs so treated one lived 14 days, another a month. The secretion of the fundus was a clear, colorless, limpid fluid containing very little mucus. It contained solids in smaller, but acid in larger, proportion than had been found in the entire gastric juice (0.45 per cent against 2.694 per cent; ash, 0.13–0.35 per cent against 0.676 per cent; free HCl, 0.52 per cent against 0.305 per cent), and organic matter, chiefly pepsin. Thus pepsin is secreted by all parts of the dog's stomach, but acid only in the fundus. In some animals the stomach is much more complex. I do not speak of the multilocular ruminant stomach; but even in those in whom there is but one cavity we often find a region devoid of glands and lined by a scaly epithelium, and Ellenberger[9] and Hofmeister have recently described six separate regions in the stomach of the pig.

The chemical changes effected by the gastric juice in the different food stuffs have been studied mainly by the method of artificial digestion. There is no difficulty in getting an extract of the mucous membrane of the stomach which shall contain pepsin in greater or less purity, and which, when made suitably acid by HCl, shall dissolve and change, or, as it is said, digest proteid substances. It is only on these proteids that artificial gastric juice will act.

The proteid of a solid is observed, firstly, to swell and then to dissolve. If the action is prolonged, under favorable conditions, the final result is a substance called peptone. This differs in many important respects from the original proteid. It does not precipitate with heat or HNO_3, or with K_4FeCy_6, or NaCl in acid solution. It is not precipitated by neutraliza-

tion, or by many metallic salts. It is not precipitated by $(NH_4)_2SO_4$, but if a peptone solution be saturated with this salt and boiled at 110° C. a resinous mass separates. Peptone is completely precipitated by tannin, $KI+HgI_2$, and nearly so by phosphotungstic acid, phosphomolybdic acid, and picric acid. It is also precipitated, but incompletely, by alcohol. The peptone got by acid peptic digestion is known as amphopeptone, and is uninfluenced by further gastric digestion, but when submitted to pancreatic digestion half of it disappears and is transformed into leucin, tyrosin, and other bodies, while the other half remains, giving much the same reactions as before. This unaltered peptone is called antipeptone. Gastric or amphopeptone is thus supposed to be a mixture of antipeptone, which resists further change by the pancreas, and hemipeptone, which by the pancreas is further broken up. It is probable that peptone has never yet been got perfectly pure. Kühne and Chittenden[10] have prepared ampho- and anti-peptone by an elaborate method, but the differences in the elementary composition found in the different analyses suggest that these bodies are mixed with other unknown substances. As found, they were, when dried, very hygroscopic powders, hissing and giving off vapor when moistened, like phosphoric anhydride. They had a disgusting, bitter taste, and rotated the plane of polarization to the left. While amphopeptone gave Millon's reaction, antipeptone did not.[11] As this reaction is known to depend on the presence of the phenol group of aromatic substances, which includes tyrosin, aromatic oxyacids, phenol, cresol, we must conclude that between the two peptones, which resemble each other in so many respects, this great difference obtains—that the aromatic phenol group is absent in anti- but present in hemi-peptone. Corresponding to this, where antipeptone was decomposed by boiling with H_2SO_4, little or no tyrosin could be got.

While solutions of albumin filter and dialyze with great slowness and difficulty, peptone solutions filter freely and dialyse with comparative rapidity. This would point to a diminution in the size of the molecule. Whether this is due to a polymerization or to a hydrolytic splitting of the proteid molecule is a matter of uncertainty. The results of elementary analysis do not settle the question. Whatever the change consists in, it is evidently one which can easily be gone back

on. We know that during digestion in the living body peptone is formed in considerable quantity, while no peptone can be found in the blood; hence, during the act of absorption a reconversion of peptone into albumin must be effected. Outside the body Henniger, by action of acetic anhydride, and Hofmeister, by action of an elevated temperature on peptone, have converted this into a body giving proteid reactions, while, more recently, Michailov [12] has found that concentrated alkaline peptone solutions, by merely standing at body temperature, are changed partly into globulins, partly into albumins.

But between the original proteid and the ultimate amphopeptone are many intermediate stages, and there is much probability that the matters are absorbed when they have reached these stages without going any further. These intermediate products are, therefore, of interest, not only chemically but physiologically, and they have been made the subject of extensive researches in recent years.

As first product is a substance which is completely precipitated by neutralization. This is closely related to, if not absolutely identical with, acid albumin, which is got, although more slowly, by action of acid alone, without aid of pepsin. Between this and peptone are a group of bodies known as albumoses, for our knowledge of which we are largely indebted to Kühne and his school.

These bodies can be got as follows: If all the coagulable albumin is separated by heat and the acid albumin by neutralization, there remain only the albumoses and peptones. Ammonium sulphate does not precipitate the latter, while by it the albumoses are completely precipitated in a soluble form. It would occupy too much time to enter at any length into the history of these bodies, of which there are several kinds. I must confine myself to only a few statements. From the artificial digestion of fibrin Kühne and Chittenden [13] have got four albumoses: 1. Proto-albumose, precipitable by saturation with NaCl, and soluble in cold and hot water. 2. Hetero-albumose, precipitable by NaCl to saturation, soluble in dilute saline solution, but insoluble in water, hot or cold. 3. Dys-albumose, precipitable by saturated NaCl, but insoluble in dilute saline solution and in water. 4. Deutero-albumose, not precipitated by NaCl, but by NaCl+acetic acid. These reactions admit of a ready separation of these bodies.

Albumoses of similar kind have been got from myosin[14] (myosinoses); from globulin (globuloses);[15] from egg albumin;[16] from casein (caseoses);[17] from elastin[18] (elastoses).

Albumoses are bodies very commonly found in both the animal and vegetable kingdoms. They are of interest because, among other reasons, they have often extremely poisonous properties. It has long been known that so-called peptone injected into the blood-vessels of dogs and cats causes extreme depression and lowering of blood-pressure, with tendency to hemorrhage, and often death, and that the blood loses temporarily its power of coagulation. Kühne and Chittenden found that the pure peptones had not this effect; and Pollitzer[19] found that antipeptone was usually without effect, while, in decreasing degree, hetero-albumose, proto-albumose, and amphopeptone caused narcosis, fall of blood-pressure, and loss of coagulability of the blood in dogs. From the recent researches of Brieger and Fraenkel[20] in the poisonous products of the metabolism of the diphtheria bacillus and other pathogenic micro-organisms, it appears that these are of an albuminous nature, probably closely allied to albumoses; while the investigations of Weir Mitchell and Reichert[21] and those of Wolfenden[22] show that in snake venom the poisonous principle is not an alkaloid, but an albuminous substance of a globulin and peptone-like nature, which will possibly turn out to be an albumose. Martin and Wolfenden[23] have found that the jequirity poison is not, as was at one time supposed, of a bacterial nature, but is due to a globulin and an albumose, both of which have been isolated and their action studied.

Before proceeding to the recent additions to our knowledge of the chemical processes which take place in the human stomach, and the means by which they have been arrived at, a short account may be given of some of the more interesting facts which have been ascertained in the case of animals.

Schmidt-Mülheim[24] found in dogs fed on meat that digestion is mainly effected in the stomach; that the greater part of the proteid is converted into peptone; so that at all stages of digestion the peptone is to the simply dissolved albumin as 2 is to 3 about. Further, not only is the proportion of these bodies to one another constant, but the absolute quantities of each in the stomach is constant, showing that as fast as the proteid is digested or dissolved it is either absorbed or passed

on into the intestine. The remarkable dryness of the contents of the stomach is noteworthy, so that in the first six hours it was not coherent, but fell to pieces in a crumbling state.

In contrast to the carnivorous dog we may take the herbivorous horse. In this animal the stomach is remarkably small, having a capacity of only 15–18 litres. "When a horse eats five kilos of hay, representing one-half its daily ration, requiring two hours for its consumption, and impregnates it with twenty litres of saliva, the mass would occupy a space of 28–30 cubic decimetres (litres). As the stomach is functionally most active when only two-thirds distended—that is, while containing about ten litres—the stomach must, therefore, fill and empty itself two or three times during one meal."[25] Stomach digestion is thus reduced to a very short process, and digestion is largely effected in the capacious and complicated intestine. Nevertheless, Goldschmidt[26] has shown that even in the horse the stomach is, considering its size, much more active than the intestine. In the former 55 per cent proteids and 40 per cent non-nitrogenous matters are digested, while in the intestine only 75 per cent proteids and 65 per cent non-nitrogenous matters are digested. Ellenberger and Hofmeister[27] find in the horse that in the first stage of stomach digestion lactic acid only is present, and during this period the transformation of starch into sugar under the influence of the swallowed saliva (and possibly of an amylolytic ferment furnished by the stomach itself) may still go on. Later HCl appears and increases until, when it has reached 0.03–0.04 per cent, the digestion of starch is no longer possible. This is generally true for herbivoræ and omnivoræ, including, as we shall subsequently see, man; but in carnivoræ, although at early stages HCl is present only in very small quantity, and not to be detected by ordinary tests, yet there is no lactic-acid stage.[28] Ellenberger and Hofmeister,[29] too, find in pigs fed on pure meat diet that there is little organic acid in the stomach contents, while on starchy diet these acids are abundant.

Goldschmidt,[30] however, finds that the process is more complicated than this simple division into two stages would indicate. There is, first, a pure amylolytic stage lasting about an hour, in which, in all parts of the stomach, starch is converted into sugar and lactic acid. Secondly, an amyloproteolytic stage, in which amylolysis occurs chiefly, and in all parts,

but also proteolysis everywhere, but specially in the fundus part of the proper secreting stomach; this stage lasts up to about the seventh hour. Thirdly, there is a stage of partial, or local, digestion, in which, in the middle region of the stomach—that is, those parts where the proper fundus glands exist—proteolysis only occurs, while elsewhere starch is digested. This stage usually lasts until the next meal, but is sometimes followed by a fourth stage, in which, from abundance of HCl in all parts of the stomach, amylolysis is no longer possible, and proteolysis only occurs. These stages pass gradually into one another, and their distinctness is not always evident. The contents of the stomach are very dry, and fresh food pushes before it what was already in the stomach without becoming mixed with it. The kind of digestion which any particular particle of food undergoes depends very much on the course it takes between the œsophagus and the pylorus. From the former the food diverges in a fan-like manner. Those parts which in their passage are most exposed to the action of the fundus, where only HCl is secreted, undergo most proteolytic changes; elsewhere amylolysis preponderates.

Among omnivoræ important observations have been made in the digestion of the pig.[31] In this animal the stomach consists, as said, of several regions differing from one another in structure. Near the entrance of the œsophagus is one devoid of glands and secreting nothing. The diverticulum from the left extremity and a region corresponding to the left half of the great curvature yield an alkaline secretion containing no pepsin, but a diastatic ferment. The remainder of the great curvature has true fundus glands, and secretes HCl and pepsin and rennet, while the lesser curvature and pylorus yield a neutral secretion containing no acid, very little pepsin, and much mucus. In this animal also the contents of the stomach are very dry, and mixture takes place to only a very limited extent. Digestion runs in stages, at first one in which lactic acid only is present, and in which everywhere amylolysis, without proteolysis, takes place. Gradually the fundus portion secretes HCl and pepsin; and here proteolysis only occurs, while in the cardiac portion amylolysis still takes place, and in the pyloric portion both starch and proteid are undergoing digestion. Finally, a stage of almost pure proteolysis—but even to the last some amylolysis takes place at the cardiac

end. With a diet of potatoes the results are quite analogous to those described above, which were obtained on a diet of oats. As stated above, in pigs the lactic-acid stage is slight or absent on a purely flesh diet.

These differences in the powers of stomach digestion in the different species of animals make it impossible to conclude from physiological experiment as to the details of the process as carried on in the human body. Hence it was of the greatest importance that observations should be made on men, and having got an accurate knowledge of the normal course of digestion, that a study should be made of the variations which occur in the chemistry of digestion in the abnormal conditions of the human stomach. Until recently our information on this point was mainly derived from the cases of gastric fistula, more particularly from that of the famous Alexis St. Martin, on whom Dr. Beaumont's classical observations were made. It is unnecessary to refer further to these observations, since they are in their main features familiar to every one. But of late years a method has come more and more into use which has thrown a flood of light on the normal and abnormal chemistry of the stomach, which is of daily practice abroad, but which is as yet far too little employed among us. The main object of this paper is to bring this method prominently under notice and to recount the most important results which have been arrived at by its means.

Considering how readily accessible the stomach is, it is strange that it is only recently the process of digestion has been studied by removal of the contents of the organ at varying periods after eating and examination of the matters thus withdrawn. By this means the characters of the secretion and the effects produced by its action on the different kinds of food stuffs can be determined with greater certainty than in any other way, and a completely objective and scientific knowledge can be obtained of the disturbed function of the organ, contrasting with the obscurity and uncertainty of the information derivable from symptoms for the most part of doubtful import.

It has been objected that the passage of a tube into the stomach is a disgusting procedure, and would not be submitted to by patients. The disgustingness of a medical or surgical method of treatment is entirely a matter of conventionality.

To my mind the passage of an œsophageal tube is less disgusting than the administration of an enema, and infinitely less disgusting than a rectal or vaginal examination. When patients get used to hearing of it they will not think of it as strange or disgusting, and in cases where it is practised the relief obtained is so great that patients are seldom unwilling to submit themselves to a repetition of the operation as often as is necessary.

The procedure is very simple. A soft India-rubber tube is passed without difficulty into the stomach.[32] If the patient then makes a forcing movement with the abdominal muscles, the contents of the stomach are expressed through the tube, and can be collected for examination. If it is desirable to wash out the contents of the stomach completely a longer tube is used, water is poured in from a height by a funnel until a sufficient quantity has been introduced, then the funnel is lowered and the contents run off by a siphon action, which if it does not start of itself can be readily set going by a contraction of the abdominal muscles. I am aware that the practice of washing out the stomach in cases of gastric enlargement with fermentation of the contents is largely employed here, although by no means so largely as it deserves; but the method of diagnosticating stomach diseases by a study of its contents removed for this purpose is, I believe, not at all employed. It is this proceeding which I would now advocate, as having already introduced a new era into the history of gastric pathology and therapeutics and as promising still greater results in the future.

I shall first briefly indicate the principal results which have been got by a study of normal digestion, and then notice what has been found in abnormal conditions.

The question would be greatly complicated if it was attempted to study the digestion of one of our usual complex meals, composed as it is of all kinds of the most heterogeneous matters.

It is necessary to take a simpler object for examination. The first systematic observations of this kind were made by Ewald and Boas,[33] who had at their disposal female patients whose digestion was good and nutrition perfect, but who had the habit of vomiting at variable times after meals, either voluntarily or when they drank some water. With the

vomited matters or the contents of the stomach removed by expression the observations were made. The patients received meals composed either of white bread and water, of scraped meat, of egg albumin, potatoes, or of these substances combined. The main results arrived at were these:

During fasting the stomach is found free from remains of food. Water introduced and withdrawn is neutral, and contained neither HCl, nor lactic acid, nor peptone.

Very shortly after a meal of 60 grams of white bread (even within 10 minutes) fermentation lactic acid is present, and increases up to 30–40 minutes, then HCl appears. Further on HCl increases, while, *pari passu*, lactic acid diminishes, and after about an hour HCl only is present. The same is true with potatoes.

With scraped meat lactic acid is found also at early stages, but now it is not fermentation or æthylidene lactic acid, but æthylene or paralactic acid. This acid occurs up to 50 minutes after food. From 60–90 minutes it is found together with HCl, while this acid only is found after 100–120 minutes. The course is similar, but more rapid, with fish diet. In all these cases the lactic acid is not secreted by the stomach, but derived from the food—the æthylidene lactic acid by the fermentation of the carbohydrates, while the sarcolactic acid is extracted from the meat. That this is so is shown by the absence of lactic acid at all stages of digestion of egg albumen, which contains no lactic acid and cannot furnish it by fermentation. When bread, meat, and albumen were given together, the same three stages were observed. That HCl promotes the disappearance of free lactic acid from the stomach is probable from the above observations, and was proved by experiments specially directed to this point. This is due apparently to the more ready decomposition of alkaline chlorides by lactic acid when some free HCl is present, and also possibly to a more rapid removal of lactic acid from the stomach, while its further formation by fermentation is prevented by the presence of HCl. That lactic acid, however, is not necessary for the formation of HCl is shown by the presence of the latter in digestion of egg albumin, when lactic acid is absent at all stages. Since peptone is present even in the first stage of digestion, some pepsin must then be secreted. The quantity is, however, very small, and it is only coincidently with the appearance of

HCl that the pepsin becomes abundant. Everything which slows digestion delays the appearance of HCl and prolongs the lactic-acid stage. This was found to be the case during menstruation, in subacute and chronic gastric catarrh, and markedly so when fat was added to the food. Hence we have in the undue prolongation of the first stage of digestion an objective measure of the degree of dyspeptic conditions.

It is obviously necessary, in order that the digestive power of different stomachs may be compared, that the substances submitted to digestion should be always similar in quantity and quality, and further, in order to facilitate the examination, it is advantageous that the food given should, while containing representations of the different food stuffs, be of as simple composition as possible. Of these test-meals two have been chiefly employed—the Probefrühstück, recommended by Ewald and Boas; and the Probemittagbrod, used by Leube and Riegel. The former consists of 35 grams of white bread and one-third litre of water or weak tea without milk or sugar. The examination is made one hour after eating. The Mittagbrod is more like an ordinary meal, consisting of 300–400 grams of soup, 125 grams of beefsteak, with 50 grams of white bread, and sometimes potatoes. This meal requiring much longer digestion, the contents of the stomach are not drawn off until 3–4 hours after eating.

Some discussion has arisen as to the respective merits of these test-meals. The question has been examined by Einhorn,[34] who administered both to the same persons on the same day, and compared the results. He experimented both on persons with disordered digestions and those whose stomachs were healthy. He concludes strongly in favor of the simpler Frühstück. He finds that the quantity of acid salts introduced with the meat greatly complicates the determination of the HCl; that, while an hour after the Frühstück lactic acid is usually absent and HCl present, 3 to 4 hours after the Mittagbrod lactic acid is usually present and free HCl is variable, and often absent, being all combined with albuminates or otherwise. In the long time which elapses between eating and the examination in the Mittagbrod, the fluid part of the food is often absorbed to such a degree as to make the removal of the contents of the stomach difficult and to render it impossible to obtain enough fluid for the application of the necessary

tests. Besides, as pointed out by Ewald,[35] the matters withdrawn after the Frühstück are much less offensive than those after the Mittagbrod. The bread contains all the food stuffs —proteids, fat, carbohydrates, salts, and extractives. It is, of course, not a very severe test of the powers of the stomach, but it has been found to work well and a great part of our knowledge has been got by its means.

The course of the normal digestion of such a meal shows the following stages in acidity: Within 10 minutes the filtered contents of the stomach are acid, either from free acid, acid salts, or both. Free acid, if present, is lactic acid. It is probable that from the first HCl is present, but its presence is concealed in consequence of its being combined, or because of the presence of salts, which interfere with the delicacy of the tests. Up to 30–40 minutes lactic acid only is discoverable by the chemical tests. After this first stage is a second, in which HCl appears and can be found in increasing quantity, together with lactic acid. With the small meal HCl increases to a maximum of 1.5–2.0 per thousand, but with a more abundant meal it may rise to 2–3.3 per thousand. After about an hour HCl alone is found. Some lactic acid may still be present, but unless in pathological amount is not discoverable by tests.

In an examination of the contents of the stomach got by vomiting or removal by the tube we have to consider—firstly, the acids; secondly, the ferments; and, thirdly, the changes effected in the food during its stay in the stomach.

The gastric contents are usually acid both in health and disease. The presence of an acid reaction should be due to free acid, but is often due largely or altogether to acid salts. We have, therefore, to determine first whether free acid is present, and then to investigate the nature of the acid. The normal acid of the gastric juice is HCl, but, as we have seen, it is usual at certain stages of digestion to find lactic acid either alone or in company with HCl. It is by no means rare to find other organic acids, chiefly acetic and butyric acid, which owe their origin to abnormal fermentation.

A really accurate scientific examination of the acids is accompanied by some difficulty, and can be carried out only by one versed in chemical manipulation and with the resources of a chemical laboratory. The principle consists in separating the volatile acids by distillation, removing the lactic acid

from the residue by repeated extraction with ether, and finally titrating what is left for HCl. In order not to overestimate this by counting in the acid salts, it has been proposed[36] to precipitate the free HCl by freshly-prepared cinchonin, to extract with chloroform the compound of HCl and cinchonin, and then titrate the former by silver.

To separate the HCl from the organic acids, and to estimate it quantitatively, Sjöqvist[37] adds $BaCO_3$, evaporates to dryness, and carbonizes the dry mass. By this means the baryta salts of the organic acids are changed to carbonates. The mass is then extracted with water. This leaves the insoluble $BaCO_3$, but extracts the $BaCl_2$ from the original HCl. In this the Cl can be determined by titration with potassium bichromate.

V. Jaksch[38] modifies and simplifies this process by estimating not the Cl, but Ba, in the $BaCl_2$ gravimetrically as barium sulphate.

All these methods require time and chemical skill which are not possessed by the average medical man, and consequently, if a chemical analysis of the contents of the stomach is to be used for clinical purposes, some simpler methods of examination must be found. Several of these have been introduced of late years—which, although they cannot pretend to scientific accuracy, are, nevertheless, of sufficient delicacy, and, if carefully employed, are sufficiently free from fallacy to justify their use; and it cannot be denied that by their aid our knowledge of the physiology and pathology of stomach digestion has been considerably advanced.

These are mostly color tests. It would take too much time to describe them all, and this is the more unnecessary as a very full description of them is given in the recently translated work of v. Jaksch on medical diagnosis.[39] I shall merely mention those which I have found most useful, and whose employment will usually suffice in practice.

In order to determine whether the acid reaction is due to free acid or acid salts, tropæolin (00) or Congo-red may be employed. The former becomes brown, the latter blue, if free acid be present, while these reactions are not produced by acid salts.

In order to show whether the free acid is HCl or lactic acid, we use methyl or gentian violet, which is turned blue

by HCl, but is not changed by lactic acid except this acid is present in larger quantity than is usually the case. Still more delicate is the phloroglucin-vanillin test of Günzburg.[40] This test will show HCl in dilution of 0.05 per thousand (1 in 20,000), while methyl-violet fails below 0.24 per thousand (1 in 4,000).[41]

In order to show the presence of lactic acid, Uffelmann's iron carbolic acid test gives good results. The fallacies arising from the sugar and phosphates may be avoided by testing, not the original filtrate of the stomach contents, but the residue of the ether extract of this. This will detect 0.1 per thousand lactic acid.

Butyric and acetic acid are best detected by their smell.

The total acidity of the stomach contents is determined by titration with dilute ($\frac{1}{10}$ normal soda solution). Each c.c. of this solution is equivalent to 0.003646 HCl. On hour after the Probefrühstück 10 c.c. gastric contents should require from 4–6.5 c.c. of the alkaline solution, which equals 0.146–0.237 per cent. Values above or below these limits are pathological (Ewald).

For pepsin we have no test except its power of digesting proteid. Some of the fluid to be examined is placed in a test-tube, and small pieces of boiled fibrin or, still better, slices of boiled egg albumen are added, and the whole is placed in the water bath regulated at 100° F. If the fluid is neutral or very feebly acid some dilute HCl should be added. It is well to act on these portions: 1. The original filtrate. 2. The same, with addition of an equal quantity of dilute HCl. 3. The same as 2, but boiled for a few seconds. In this last no solution of proteid should occur. The quantity of the fluid should be the same in the three tests, and to each the same quantity of proteid should be added.

The other ferment or the rennet can be detected only by its power of coagulating milk in neutral solution. Some interesting and valuable observations have been made recently on the occurrence of this ferment. Schumburg[42] examined the stomachs of human corpses, and got variable results, sometimes positive, sometimes negative. Among the former was a six-months' fœtus. In the stomach of a calf immediately after death abundant rennet was found, while in the contents of a dog's stomach, vomited after apomorphin, only feeble re-

sults were obtained. The contents of the living human stomach were got by swallowing sponges. Out of ten experiments made in this way only one yielded positive results. Boas[43] has studied the contents of the human stomach withdrawn during life, in both healthy and diseased persons. He finds that sufficient care has not been taken to distinguish between the perfectly-formed rennet ferment and its zymogen. Whenever free HCl is present, either during digestion or in case of hypersecretion during fasting, there rennet is found. The zymogen is present also during the entire period of digestion and can be shown by its greater resistance to alkalies. Thus the contents of the stomach are made alkaline with Na_2CO_3. This destroys the ferment, but not the zymogen. If the fluid be then made acid and finally neutralized, or if $CaCl_2$ or other lime salts be added, the zymogen is converted into the ferment and milk is coagulated. The zymogen is also much more resistant to elevation of temperature than the ferment, which is destroyed at 70° C. When acid is absent ferment is also absent, but the zymogen is present. The same is true of pepsin and its zymogen. Thus an important function of the acid of the gastric juice is to convert the zymogens which are secreted by the glands into the active ferments.

Klemperer,[44] too, arrives at very similar conclusions. The ferment he finds present only when acid is present. The zymogen is always to be found. Hence the examination for rennet has no diagnostic importance, since its presence or absence is only an additional proof of the presence or absence of acid, while the absence of zymogen would point to serious impairment in the functions of the stomach glands.

These researches[45] give new ideas as to the use of adding lime-water or other lime salts to milk in cases of difficult digestion. The commonly-received view is that the lime prevents or modifies the coagulation. But it would appear that its use is to favor coagulation, and so to prevent the undigested milk from passing too rapidly into the intestines.

I shall now notice some of the more important diseases in which the chemistry of stomach digestion has been investigated, and in which this investigation has increased our knowledge.

I. Cancer.

Of these one of the most important is cancer of the stomach. It is unnecessary to remark on the great difficulties which frequently attend the recognition of this affection, and it must be evident that now more than ever an early diagnosis is desirable, since if surgical interference is ever to succeed, it must be when it is undertaken at the commencement of the disease.

It is now many years since Van der Velden announced that in cancer of the stomach free hydrochloric acid is absent in the contents of this organ. A similar observation was made, however, many years previously by Dr. Golding Bird, and has been rescued from oblivion by Ewald.[46] The importance of the subject is shown by the large number of works which have been devoted to it in recent times. Among the most important of these are the reports of Professor Riegel, of Giessen, on the cases of stomach diseases treated in his klinik during the years 1885 and 1886. These cases were observed in the most careful manner. The stomach contents were repeatedly examined for HCl and inorganic acids, and in all cases their power of digesting albumin was tested. In the first report[47] 15 cases of cancer of the stomach are tabulated. In 13 there was dilatation of the stomach. In 2 this could not be detected. In 5 cases the diagnosis was confirmed by autopsy. In the others the diagnosis was made by the usual symptoms—as tumor, ectasia, hæmatemesis, cachexia, etc.; 231 observations were made. In none of the fatal cases was HCl ever found. In 3 of the others it was present at first, but disappeared in the later stages. Riegel thinks that the constant, or almost constant, absence of free HCl, supposing that the examination is rightly made, speaks strongly for the diagnosis of cancer; the presence of free HCl, supposing the examinations are sufficiently often repeated, speaks equally or more strongly against cancer. Although for seven years he has examined every case, he has never met a case of carcinoma in which free HCl was constantly found, and in which normal digestive power existed. He quotes cases in which, in absence of other symptoms, and in young persons, the diagnosis of cancer was made solely on the constant absence of HCl, and cases in which the general symptoms pointed strongly to cancer, and yet from

the presence of HCl the contrary diagnosis was made, and in both instances the result showed the justice of the opinion arrived at.

In the second report [48] we have a record of 306 observations of the gastric contents of 16 cases of cancer. Five cases were fatal. In no single one of these was free HCl found, and in not one of 154 artificial digestion experiments was albumin digested. Of the remaining 11 cases, 8 never had any free HCl, and manifested no digestive power, while the remaining 3 at first showed traces of free acid and of peptic power, but subsequently lost both.

Jaworski and Gluzinski [49] also found no free HCl in the examination of their cases of carcinoma of the stomach.

These observations were made by the color tests. By the more accurately scientific, but by no means unobjectionable, methods of Cahn and v. Mering, HCl is found in cases of cancer. The acid residue, however, left after removal of the volatile acids and of the lactic acid does not give the color tests, and, above all, does not digest albumin. Hence the HCl is not free, but combined—probably largely—with proteid substance or peptone. If to the gastric juice of a cancerous patient HCl be added, it to a great extent disappears as free acid, while the volatile acids and lactic acids increase.[50] This points to the deficiency of HCl for the complete saturation of the ingesta.

Rare cases of cancer, however, occur in which free HCl is present. Cahn reports one,[51] and in the discussion on his paper others were mentioned. Ewald [52] details a case where, until shortly before death, free HCl was present, although it disappeared before the operation was performed, in consequence of which the patient died. In some of these cases the cancer seems to have been secondary to an ulcer, in which condition, as we shall subsequently see, the free acid is usually increased.

The question then arises, What is the connection between cancer and the disappearance of HCl from the gastric juice? On this subject two views are held. According to the one, supported by Ewald, Stiénon, Rosenheim, etc., the chemical insufficiency is due to an inflammatory or atrophic condition of the entire mucous membrane. According to Ewald,[53] the condition is one of catarrhal inflammation; Stiénon [54] has found in 4 out of 8 cases atrophy of the glands; and Rosenheim [55]

found in 14 out of 16 cases of cancer inflammatory degeneration of the mucous membrane, commencing as catarrhal inflammation, advancing to interstitial change and atrophy.

On the other hand, Riegel doubts the general validity of this explanation, and thinks that the absence of the acid is due not so much to its non-secretion as to its being combined by some substance arising from the cancer. This view is supported by a case in which the stomach was free from disease, but the cancer was situated at the commencement of the duodenum, and nevertheless there was an absence of free acid and of peptic potency. Rosenbach,[56] who thinks very little of the value of an examination for free acid in the diagnosis of carcinoma, holds that the occasional absence of acid occurs in those cases in which the cancer is ulcerated and furnishes from its discharging surface albuminous matters which combine with and conceal the acid.

More important than those cases of cancer in which HCl is present are those cases in which the acid is absent and yet the disease is not carcinoma. That such cases occur is admitted by every one, but they are seldom of a kind which can be confounded with cancer. Among the more important conditions in which this occurs may be mentioned four—extensive amyloid disease of the stomach; severe mucous catarrh, leading to atrophy, neurasthenia, great anæmia; certain cases of nervous dyspepsia; advanced cases of renal disease and cancer of the œsophagus.

Riegel[57] has, however, in cases of cancer of the œsophagus, found the secretion normal, while he records cases of permanent regurgitation of bile into the stomach, and a case of true gastritis[58] from drinking sulphuric acid in which HCl was permanently absent.

In cancer the organic acids are usually abundant in the contents of the stomach, and, except in very rare cases, pepsin is present, although sometimes in diminished quantity. The anatomical changes found in the mucous membrane are least marked near the pylorus, and from the glands of this part the pepsin may be furnished, even while the oxyntic glands of the fundus may be out of action. As is known, pepsin is usually to be found in the urine, and its source is believed to be the stomach, from which it is absorbed. In some cases of cancer of the stomach pepsin has been absent from the

urine;[59] hence we may assume that it has not been formed by the peptic glands.

As regards the presence of rennet, in three cases of cancer of the stomach Boas found no rennet in the contents withdrawn from the stomach. In two of these, however, milk was coagulated when swallowed. He regards[60] the absence of rennet as not typical for carcinoma, but merely as an expression of the general degeneration of the mucous membrane which occurs in this disease, and to which he attributes also the absence of HCl.

On a review of the entire subject, while it must be admitted that rare cases of cancer occur in which free HCl is present, and that still more frequently HCl is absent in cases which are not cancer, so that this sign is no more than others absolutely pathognomonic, yet it is one of great importance, and in all suspicious cases frequent chemical examination of the contents of the stomach should never be omitted.

II. Chronic Ulcer.

In great contrast to cancer stands another very common disease of the stomach—namely, chronic ulcer. Of this condition Riegel gives in his first report 8 cases, with 21 observations; in his second, 42 cases, with 382 analyses. In all of these acid was present, and in most cases in considerably larger quantity than in health—0.4–0.5 per cent against 0.15–0.2 per cent. Van der Velden[61] also has found hyperacidity—0.26, 0.47, and 0.42 per cent in three cases respectively. The digestive power of such gastric juice is greater than normal. Organic acids are absent or present in small quantity.

Other observers have, however, not found the hyperacidity of the gastric juice so constant a symptom in cases of ulcer. Gerhardt[62] got in 7 out of 24 cases negative results by testing for acids with color tests, and Rosenheim, who examined 8 undoubted cases by the method of Cahn and v. Mering, found in 2 hyperacidity, 4 times normal amount of acid, and twice diminished acid. Ewald, too, adduces evidence against the universality of the rule of Riegel, but admits that the want of hyperacidity is the exception. On the part of the most experienced physicians a fear is entertained of the use of the tube in gastric ulcer. Some cases are recorded of hemorrhage, and even perforation, following its employment.[63]

Hyperacidity, so frequently associated with gastric ulcer, to the occurrence of which it is a strong predisponent, is apt to pass into hypersecretion, a condition in which, even during fasting, an acid fluid, having all the characters of gastric juice, is secreted in such quantity that 300 to 500 c.c. may be drawn off. The fasting secretion may be of the degree of acidity of normal gastric juice, while that secreted during digestion is abnormally acid.[64] Such a state of hypersecretion may occur as an acute and transitory affection principally in nervous persons. Its occurrence as a chronic condition, although mentioned by several older writers, chiefly English, has only recently attracted very much attention. Riegel,[65] in his second report, records 686 analyses of the gastric contents of 18 such cases. In these the digestion of albuminous food is rapid and complete, while the digestion of starchy food does not take place owing to the high acidity. This retention of matters in the stomach leads usually to dilatation.

In these cases matters lodge in the stomach owing to deficient absorption and impairment of the motor power of the stomach, and these retained matters keep up the irritation on which the abnormal secretion depends.[66]

It must not be supposed, however, that in all cases of acidity, whether with or without hypersecretion, the absorption is defective and movements sluggish. On the contrary, the absorption as tested by iodide of potassium has been found in such cases abnormally rapid, and Van der Velden[67] has found in healthy persons that this drug appeared more rapidly in the saliva if acid were swallowed than if merely water were drunk. In many cases of hypersecretion and acidity increased peristalsis occurs; that, nevertheless, matters tend to lodge abnormally long in the stomach is due to a simultaneous non-activity of the pylorus leading to spasmodic closure.[68]

The diagnosis of hypersecretion is to be made with certainty only by an examination of the contents of the stomach, removed during fasting after previous washing out of all remains of food. In many cases, in the morning after the stomach had been washed out the evening before, and no food taken in the interval, considerable quantities of gastric juice are found. In other cases, as in those of Van der Velden, the stomach is empty after the night. The symptoms are ambiguous. The patients have usually complained of stomach

distress for a long time. They suffer from pain, often of a spasmodic kind, relieved by eating, particularly albuminous food; heartburn, shown by Reichmann[69] to be due to the entrance of acid matters into the œsophagus; eructations of odorless gas, and sometimes vomiting of intensely acid matter. Increased thirst and large appetite with emaciation sometimes cause a suspicion of diabetes. Whether the disease is ever primary, due to abnormal innervation of the gastric glands, is uncertain. Its connection with gastric ulcer and catarrh has been already noticed. In some cases it has followed an indiscretion in diet[70] or drinking large quantities of cold water.[71] By suitable treatment great improvement usually results; but a complete cure is rare.

III. Catarrhal Inflammation.

There is no affection of the stomach so common as inflammation of the mucous membrane. Diphtheritic or phlegmonous inflammation is, it is true, rare; but so-called catarrhal inflammation is of the greatest frequency. Although called catarrhal, this cannot be looked on as of the same nature as a catarrhal inflammation of the conjunctiva or respiratory mucous membrane; for the mucous membrane of the stomach is not a mere investing membrane, but a mass of glands whose inevitable involvement in any inflammation gives this a parenchymatous character,[72] where not only the connective tissue and surface epithelium are affected, but also the glandular cells. This inflammation is acute or chronic. It is caused by irritants, generally food or drink unsuitable in quantity or quality, by all causes which lead to chronic hyperæmia of the stomach, and by various conditions of the blood, chiefly those in which poisonous matters are excreted by way of the gastro-intestinal mucous membrane, the most ordinary example of which is to be found in cases of chronic uræmia.

The anatomical changes are hyperæmia and infiltration of the mucosa with round cells, increased formation of mucus, and various forms of degeneration of the epithelial cells of the glands. If the disease goes on, a condition of cirrhosis is induced, in which, with atrophy and cystic degeneration of the glands, an increase of connective tissue takes place, frequently associated with pigmentation, polypous excrescences, or even extensive ulceration.[73]

The general symptoms of gastritis, or, as they are called, acute and chronic dyspepsia, are too well known to need repetition. I shall confine myself to the chemistry of the contents of the stomach. The affection has been divided into simple, mucous, and atrophic inflammation. In the first form the fasting stomach is found to contain scanty remains of food mixed with fluid, containing but little mucus, often mixed with bile and other intestinal contents. After the test meal the acidity is found diminished, ferments scanty, peptonization takes place more or less in the stomach, and the filtrate digests when acidulated.

In mucous gastritis the chief characteristic is the large quantity of mucus found both in the fasting and digesting stomach. The acidity is slight and due to organic acids; free HCl is usually absent. The ferments are present only in traces, and albumen is digested only to the stage of albumose. The filtrate digests after acidulation, slowly and imperfectly.

In atrophy there is little or no mucus secreted. During fasting the stomach is usually empty. After eating there is a complete absence of acid and the ferments, and the filtrate, even after addition of acid in sufficient quantity, shows no digestive power.[74]

In many cases of chronic dyspepsia, heartburn and symptoms of increased acidity are marked phenomena. These are due, not to increased formation of HCl, but indirectly to its diminution, which allows fermentation to occur, the products of which cause the heartburn, acid eructations, flatulence, and many of the other symptoms of which the patients complain. It is true that recently a class of affections have been described as acid catarrhal,[75] in which, even in the fasting stomach, HCl is found, and during digestion in abnormally large amount. The digestive power of the stomach is good, but its mechanical functions are impaired. It does not appear clearly in what these cases differ from those of hypersecretion, and an acid catarrh is not admitted by those best qualified to form an opinion on this subject.[76] In many cases the diagnosis between chronic gastric catarrh and other more serious affections, particularly carcinoma and that form of nervous disturbance associated with arrest of secretion, is very difficult, and to be made only by exclusion. The difficulty and uncertainty are so great that Riegel[77] rejects the heading "Catarrh" alto-

gether, and classes his cases, which would usually be placed under this heading, as examples of subacute and chronic dyspepsia. That these cases, however, were of different kinds is shown by the fact that while in some HCl was absent, in others it was present in normal amount.

Many cases of atrophy of the stomach have been recently described, and the clinical histories and post-mortem appearances accurately recorded. The very serious symptoms manifested by these patients and the apparently inevitable termination of the disease in death, is a sufficient proof that the stomach has some function more important than that of a mere receptacle or of a disinfector. It is true that cases have been recorded by Ewald and others where patients went on pretty well although there was a constant absence of acid and ferments in the contents of their stomachs. But this satisfactory condition is only temporary; a time comes when the intestine is no longer able to compensate for the loss of the functions of the stomach, and then symptoms arise, often pretty suddenly, which persist with increasing intensity until death[78]—these are gastric pain, loss of appetite, frequent vomiting, profound anæmia—often presenting all the clinical features of progressive pernicious anæmia—extreme feebleness, but often without emaciation. In these cases the diagnosis rests chiefly on an examination of the gastric contents. These are without mucus, the food is after a test meal undigested, there is no hydrochloric acid, and the ferments are absent.

Jaworski[79] calls attention to the importance, when examining the digestive power of the stomach contents, of adding acid until the tests show the presence of free acid. He also advises, before concluding as to the absence of ferments, to introduce into the stomach dilute HCl, which is again withdrawn after a time. By this means pepsin and rennet are sometimes got, which by other methods may appear to be absent. The acid excites the glands to secretion and changes the zymogens into the fully-formed ferments.

In the case recorded by Litten and Rosengart,[80] remarkable for the youth of the patient, who was only eighteen years old, this practice was adopted, with the result that while the stomach contents acidulated after removal had no digestive power, those got by the introduction of acid into the stomach did digest albumen, although slowly; rennet was absent under

both circumstances. A microscopic examination of the contents of the fasting stomach shows no elements arising from the mucous membrane, but merely granular masses, with bacteria. Jaworski thinks this negative result characteristic of gastric atrophy.

In some cases, besides thinning of the mucous membrane, the other coats of the stomach are atrophied, and the capacity is normal or somewhat enlarged. In others the external coats are greatly thickened, there is a sort of cirrhosis of the muscularis, and the capacity of the stomach is often considerably reduced. In either case the motor function of the organ must be impaired, and to the supervention of this motor insufficiency the omission of severe symptoms is, no doubt, largely due. Litten and Rosengart found, four hours after a small Probefrühstück, remains of food in the stomach, and in other cases a similar delay was observed.

IV. Dilatation.

In no condition has the œsophageal tube been more used than in dilatation of the stomach, and under no other circumstances has its use been attended with greater benefit. Dilatation of the stomach, or gastrectasis, is, however, not a disease *per se*, but only a consequence either of increased obstruction at the pylorus, or of too great a mass to be moved, or of an enfeeblement of the muscular coat of the stomach. It is this want of proportion between the work to be done and the muscular force available to do it that causes the symptoms. Thus in many cases the stomach may be enlarged, and yet the digestion may show no impairment, because the viscus can completely empty itself; while in other instances, although there may be no great distention of the stomach, yet from the insufficiency of the muscular coat serious symptoms may be present, depending on the incomplete emptying of the contents into the intestine. The conditions are, as is well put by Ewald,[81] precisely analogous to those which occur in the case of the heart. Here, from obstruction at the orifice or other cause, considerable dilatation of the chambers may take place; but so long as the muscular energy keeps pace with the obstruction, so long compensation is effected and serious symptoms do not result. But when compensation fails, then the symptoms manifest themselves, and if the muscular tissue is

much diseased this failure may occur before the dilatation has advanced to any very high degree. It is notorious that in cases of long-standing heart disease compensation sometimes fails quite suddenly, and the same would seem to occur in cases of stomach disease which have been described as instances of acute gastric dilatation.

Those cases, then, in which by the well-known methods the stomach can be shown to have an enormous capacity and to reach below the level of the umbilicus, where after periods of increasing distress large quantities of fermenting matter are vomited in which sarcinæ and many other kinds of organisms are found, are only the last and incurable stage of a condition which, if recognized early and suitably treated, may be arrested in its progress or cured completely. Even in the advanced stage the stomach contents usually contain ferments and hydrochloric acid. Riegel,[82] in 21 cases of dilatation, made 156 observations. In only two of these cases was HCl even temporarily absent, and in not one of them was it permanently wanting. The same observation has been made by Ewald [83] and all other writers on this subject, and I have myself in several instances found that the filtrate of the contents of the stomach possessed pretty good digestive power.

Of the great relief which even in this advanced stage follows washing out of the stomach, the use of antiseptics to check the various abnormal fermentations which take place in it, and the employment of a suitable dietary, it is unnecessary to speak. At best, however, the treatment in this stage can be but palliative.

Of far more interest is it to recognize the earlier stages when the distention is only temporary and inconsiderable, and when the treatment can not only relieve but cure. By no one has this subject been more admirably discussed than by Rosenbach.[84] He points out the difficulty and uncertainty in the diagnosis of enlargement of the stomach depending partly on the normal variations in the size of the organ in different individuals, and partly on the difficulties in the methods of examination. He shows that serious symptoms may be present where there is no dilatation, and that, on the other hand, dilatation may be present and yet these symptoms may be absent; that it is, as stated above, the want of proportion between the work to be done and the energy available for its

performance that is the essence of the disease, and this he calls "Magus-insufficienz," or "gastric motor insufficiency." The causes of this are various. Some are congenital, as narrowing of the pylorus or abnormal positions of the stomach. It has many times been observed in association with movable kidney on the right side, although the connection between the two is not altogether clear. It is often due to hypersecretion or hyperacidity, which interferes with the digestion of carbohydrates, and possibly causes a spasmodic closure of the pylorus; chronic gastritis extending to the muscular coat will enfeeble this. But probably the most common cause is unsuitable food—food of an indigestible character, eaten hastily without sufficient mastication, and, above all, eaten in too large quantities at a time. In all these cases the food is too long retained in the stomach, and a too frequent repetition of this will infallibly lead to gastric dilatation.

Many ingenious methods have been devised for the detection of this motor insufficiency of the stomach. Of these one of the most ingenious is the salol method of Ewald and Sievers. Salol,[85] a phenyl ether of salicylic acid ($C_6H_4OH\ COO.C_6H_5$), is not decomposed in an acid medium, but in an alkaline medium is split into phenol and salicylic acid. The latter is excreted in the urine as salicyluric acid, and is readily recognized by the purple color it gives with neutral ferric chloride. Ewald and Sievers found that when one gram of salol was given with food the reaction manifested itself in the urine in from 40 to 60 minutes, latest 75 minutes. If it was later it appears it showed that the contents of the stomach were too long retained. As to the value of this method opinions vary. Huber[86] finds that even in healthy persons the reaction is often very late to occur, and thinks that the time of the first appearance of the reaction is of less value than the time of its disappearance. In normal stomachs this is 27 hours at latest after taking the drug, while in cases of motor insufficiency the reaction is found from 33 to 48 hours, the duration being in proportion to the insufficiency of the stomach. Pal,[87] however, in a number of carefully-conducted experiments, finds that even in cases where, as proved by the stomach-pump, the contents of the stomach pass normally into the intestine, the salicylic reaction in the urine may persist for even 72 hours. Its persistence seems to depend more on the deficient mobility

of the intestine than on that of the stomach, since it was much greater when the bowels were constipated than when the stools were normally passed.

The method of Klemperer consists in injecting into the previously-washed-out stomach 100 c.c. of olive oil and withdrawing what remains after two hours. This is a method which evidently is not of general applicability, and cannot be safely used in all cases.

The most certain and ready way of seeing whether the stomach empties itself normally is, unquestionably, to pass a tube and determine what remains in the organ. If 5–6 hours after a full meal the stomach is found empty, then the motor function is normal.

The length of time during which matters will lodge in the stomach is almost incredible. I have myself washed out of a dilated stomach a quantity of charcoal which could not have been taken later than 10 days before, and that although almost every day in the interval vomiting had occurred. In cases of motor insufficiency the treatment is evidently chiefly to be directed to sparing the muscular coat. A diet easy of digestion, and, above all, taken in very small quantities at each meal, are the chief points to be attended to. Of the value of massage and electricity much doubt may be entertained.

V. Nervous Dyspepsia.

Under the term nervous dyspepsia Leube[88] described a condition met with most commonly in young persons of the upper classes. In many such, soon after eating, nervous symptoms appear, such as congestion of the head, stupor, inability to work, fulness in the epigastrium, eructation of scentless and tasteless gas. Vomiting is rare. These symptoms, which are often associated with other nervous manifestations, are not due to any disturbance in the chemistry of stomach digestion, nor to impairment of its motor functions. They occur too soon after eating to be explained by absorption of abnormal products of gastric fermentation, and an examination of the contents of the stomach during digestion shows that the acids and ferments are normal, and that the organ is empty within 7 hours after eating. It is assumed that the symptoms are of a purely nervous character, and due

to an abnormal sensibility of the nerves of the stomach to the mechanical irritation of the food.

Riegel [89] in his first report gives the results of 68 observations on 16 cases. In all free HCl was found, and the peptic power of the stomach contents was normal.

In his second report [90] he gives 28 analyses from 9 cases. In all of these the duration of digestion was normal, and in 8 the chemistry was normal, while in one case a transitory and slight hyperacidity, due to excess of bile, was noticed. Riegel, however, thinks the term nervous dyspepsia should not be absolutely restricted to such cases, since it is quite conceivable that a disturbed secretion of the stomach may arise from a purely nervous cause, and that in a purely nervous way not only sensory but secreting and motor abnormalities may arise.

Ewald [91] calls attention to the imperfection of our methods of chemical observation, and adduces cases of a decidedly nervous character in which alterations of the chemistry were found, and also cases of unquestionable catarrh, ulcer, and carcinoma, in which the gastric juice was found normal. Further, he quotes from Leube himself cases of nervous dyspepsia in which, seven hours after eating, the food was undigested and no acid was present; while cases of catarrh, ulcer, and carcinoma have been observed in which, at this period, the stomach was empty. Hence on an examination of the contents of the stomach too much weight must not be placed. He calls attention to the frequent association of intestinal symptoms with those referable to the stomach—constipation, flatulence, severe pains in the intestine, and sometimes tenderness. He proposes to substitute for the term nervous dyspepsia neurasthenia gastrica, or neurasthenic dyspepsia.

The observations of Jürgens, who found in many cases of dyspepsia, with vague symptoms, extensive degeneration of the nervous plexuses of the stomach and intestine, and also diseases of the smaller vessels of these parts, show that we must not too hastily conclude that a mere functional disturbance exists because on superficial examination no discoverable anatomical basis for the symptoms presents itself.

It would appear, indeed, that the diagnosis of nervous dyspepsia is by no means an easy matter, and must rest, not so much on exact observations with the stomach-pump as on the general character of the symptoms, their variability, their

association with other nervous manifestations, the absence of symptoms pointing to other well-defined disorders—as ulcer, carcinoma, and catarrh, and the results of treatment.

Herzog[92] has recently examined 14 cases in order to see whether by a careful investigation of the mechanical and chemical processes during digestion precision in diagnosis could be attained.

The motor activity was tested by Klemperer's oil-method —the chemical by the usual methods—after a test-meal. In 9 cases motor insufficiency was found—that is, after two hours too much oil was still found in the stomach. Of these, 5 showed hyperacidity, 3 normal acidity, and 1 subacidity. These are three stages which follow necessarily from motor feebleness. They may occur in other conditions, as catarrh, and have consequently nothing characteristic of nervous dyspepsia.

Of the remaining 5 cases which showed good motor power of the stomach, 4 manifested hyperacidity, 1 normal acidity, and none subacidity.

He concludes that the differential diagnosis of nervous dyspepsia from other diseases of the stomach cannot be made by means of an examination of the gastric contents, since all the results got in this condition may be met with in cases where there is anatomical basis for the disease. The difficulty of distinguishing between catarrh and the neurosis is peculiarly difficult, and depends chiefly on the history of the case.

VI. Secondary Disturbances of Digestion.

In conclusion, I shall notice the disturbances of digestion which occur in some diseases other than those of the stomach. This subject is of great importance, and has hitherto received far less consideration than it merits.

1. *Phthisis.*—The great frequency with which dyspeptic troubles complicate the course of phthisis is well known. Not uncommonly the first symptoms of the disease are referred to the digestive organs, and a perhaps exaggerated importance has been assigned to this so-called pretubercular or strumous dyspepsia. Even in cases where such an early occurrence of dyspepsia does not occur, as the disease goes on, sooner or later, loss of appetite, vomiting, fulness and weight

after food, coated tongue, and other symptoms of stomach derangement show themselves, and every one knows what a serious complication they are and how unfavorably they influence the prognosis. It is consequently not to be wondered at that many investigators have studied the course of the digestion in phthisical patients by the improved methods of recent research.

Rosenthal [93] found a constant absence of HCl in the stomach contents of 6 phthisical patients at different stages of the disease, all more or less febrile. None of these patients complained of special digestive trouble, and most of them had good appetites.

Herzog,[94] on the other hand, found in 8 patients HCl constantly present—often in relatively large quantity; but in all cases he found the motor power of the stomach enfeebled, and to this he attributes the loss of appetite and other gastric difficulties.

Schetty [95] examined 25 cases without selection—men and women, in early and late stages of the disease, with and without fever. He found HCl always present—sometimes increased—and also found that the stomach was empty six hours after the test-meal. Only in 3 cases was a small quantity of fluid present without remains of food. He hence concludes that the secretion and motor power of the stomach are normal. In most of the cases there was only disinclination for food, while in some the appetite was good.

Klemperer [96] observed 14 cases. These he divided into cases of initial and those of terminal dyspepsia. The former are characterized by heartburn, eructations, sickness, fulness in the stomach, tenderness on pressure, vomiting induced not by food, but by attacks of cough. The appetite is variable and capricious. In the case of terminal dyspepsia the appetite is completely lost, there is no variation in the symptoms, there is little heartburn or eructation. Vomiting is independent of the cough, occurs every two or three days, and is abundant. The stomach is often considerably dilated, while in the initial stage it is of normal size.

In the initial stage the secretions of the stomach are normal, often with increased formation of HCl; but there is distinct enfeeblement of the motor activity. It is true that the stomach is often empty seven hours after a meal, but by the

oil-method a motor insufficiency can be detected. In the terminal stage the HCl is greatly diminished or absent, the organic acids increased, pointing to abnormal fermentation, while the motor insufficiency is pronounced. The symptoms in the initial stage resemble those of the so-called nervous dyspepsia, while in the terminal they resemble those of carcinoma or atrophic catarrh. They have nothing characteristic for phthisis, but are merely the expression of a subacute and chronic gastritis. The primary condition is motor feebleness; this, after a time, is followed by hyperacidity, probably from the irritation due to the too long delay of the food in the stomach. Finally, this leads to interglandular changes in the mucous membrane and such anatomical alterations as to cause cessation of secretion and ectasy of the stomach.

Brieger[97] seems to have met with positive results more generally than other observers. He examined 64 cases of phthisis in different stages of the disease.

Of the advanced cases only 16 per cent showed a normal secretion, while in 9.6 per cent there was a complete disappearance of the normal products of secretion.

In cases of medium severity 33 per cent had normal secretion, while in 6.6 per cent the secretion was entirely absent.

In the early stages there were about equal numbers with normal and altered secretion.

In general the motor power and faculty of absorption were altered in proportion to the alterations of the secretion.

The changes are not specific, but depend on a chronic gastritis passing on to atrophy.

Hildebrand[98] finds that the fever has considerable influence on the secretion of the stomach. When fever is constant HCl is always absent, and when fever is variable so is the HCl. A rise of temperature to 37.8° C. (100.4° F.) causes the acid to disappear.

Immermann[99] examined 54 cases, and in 51 found the stomach empty after the test-meal. In those cases where matters were still present the patient enjoyed good appetite and made no complaint of his digestion. It is consequently concluded that in those cases where true gastric dyspepsia exists, this is to be looked on as a complication and not as an essential part of the phthisis.

Schwalbe[100] has studied the anatomical conditions of the

stomach in 25 fatal cases of phthisis. In only six instances was it found healthy. In the others the changes were: slight generalized interstitial inflammation, 9 cases; round-celled infiltration, 5 cases; amyloid degeneration, 1 case; and fatty degeneration of the glands, 4 cases. On the whole, the changes were not of a very severe character, or such as to impair considerably the secretion of the organ.

The differences in the results arrived at by the different observers are instructive, and show that there is no universal condition of the digestive organs in phthisis. Furthermore, the fact that the subjective feelings of the patient do not invariably correspond to his digestive powers, as tested objectively, indicates that in phthisis, where a good nutrition is of such vital importance, the patient's feelings or desires are a fallacious guide, and in regulating the amount and quality of the food we should, wherever possible, examine into and take account of the digestive function as experimentally determined.

2. *Heart Disease.*—In cardiac disease the stomach shares in the general venous congestion, and digestive troubles are a common and serious complication of these distressing affections. Only a small number of observations has as yet been made on such cases. It has recently been shown that while starch and albuminous food are well absorbed, fats are very imperfectly taken up from the intestine.

Hüfler found in 8 cases, seven times want of HCl in the stomach and once hyperacidity, consequently never a normal condition.

Quite different are the results arrived at by Adler and Stern,[101] who, in 20 cases, found HCl constantly in 16, inconstantly in 2, never in 2. Seven patients had digestive difficulties. Of these 4 had constantly free HCl, 2 inconstantly, 1 never. The other patient, who showed a constant deficiency of HCl, enjoyed subjectively a good digestion.

Here, then, we have the same state of things as in phthisis, and may draw from them the same conclusions. Grassmann[102] has found that in cardiac cases, while carbohydrates and proteids are well absorbed, fats are taken up very imperfectly, and appear in the fæces in abnormally large proportion. This defective absorption is due to chronic changes in the mucous membrane of the intestine, and is not found only in those

instances where compensation is markedly deficient. The chronic catarrh of the stomach, which accompanies cirrhosis of the liver, is well known. How far this is due to the alcohol which commonly causes the hepatic affection, and how far to the venous congestion consequent on the partial obstruction, is not always easy to say.

3. *Kidney Disease.*—In kidney disease vomiting and other dyspeptic symptoms are almost constant, and constitute in some cases the most prominent features of the case. Biernacki[103] has examined six cases of subacute and chronic parenchymatous nephritis, with more or less œdema, and a considerable amount of albumin in the urine. The HCl was always much diminished, and in most observations absent. Lactic acid was in small amount, and pepsin greatly diminished, notwithstanding the motility was found to be unimpaired.

Fenwick[104] finds that similar changes occur in the glands of the stomach as those which occur in the kidneys, and concludes that the stomach has the power of excreting certain poisons, among which is urea; that by this an acute catarrh of the glands is caused. The vomiting in chronic renal disease he attributes to chronic gastric catarrh, and thinks that true uræmic vomiting occurs only in acute suppression of urine.

4. *Diabetes.*—Rosenstein[105] has made observations in ten cases of diabetes. In four of these the stomach contents were normal, in the remainder abnormalities were found. In some the HCl was absent for a longer or shorter time, and then returned. This he looks on as a neurosis, and he finds that, like the absence of patellar reflex and other neuroses, it has no direct relation to the severity of the disease as measured by the amount of sugar passed, or by the presence of acetone or diacetic acid.

In some cases, however, the HCl was permanently absent, and this is attributable to an atrophy of the mucous membrane depending on interstitial inflammation.

Gans[106] finds that the conditions are exceedingly variable in different individuals (normal secretion, hyperacidity, and diminution, or complete absence of HCl), and in the same individual at different times.

The motility was found always intact.

There was no relation found between the severity and duration of the disease and the condition of the stomach.

He thinks the deficient acid is more probably to be attributed to inflammation caused by excess in eating or drinking than to a neurosis.

Hirschfeld,[107] who has made a study of the metabolism of diabetic patients, describes a variety of the disease in which, while carbohydrates are all absorbed, the absorption of proteids and fats is exceedingly defective. In such cases the functions of the stomach and intestine must be performed in a very imperfect way.

These few examples will show what a fruitful field of investigation is to be found in a study of the chemistry of stomach digestion in diseases which do not primarily affect the digestive organs.

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UNSOUNDNESS OF MIND,

IN ITS

Legal and Medical Considerations.

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UNSOUNDNESS OF MIND.

CHAPTER I.

When Beccarria observed, "The happiest of all nations is that in which the laws have not become a science," we are almost disposed to suspect that he had been studying the question of unsoundness of mind in its relation to responsibility for criminal acts: certainly to no subject is the remark more applicable; for, between the diversity of medical doctrines, antagonism of legal opinions, uncertainty and difficulty which have been manifested in determining the majority of cases which the records of criminal jurisprudence supply, the student is led to the conclusion that on this particular subject the lessons of experience have been strangely lost sight of, and many doctrines perpetuated with inexplicable pertinacity, in direct opposition to ordinary rules which in every-day affairs of life regulate the conduct of men.

Was the question of unsoundness of mind a purely legal problem, one could well understand the advantage to be derived from the retention of the opinions of those whose erudition and intelligence have dignified and shed a lustre on the bench. Was mental disease of necessity associated with appreciable structural change, it would be but natural to expect that, as a capability of ultimate analysis progressed, accuracy in the formation of opinions would have been proportionately attained. Could the mind be regarded as a series of simple, untangible creations, which, though immaterial and beyond reach, were still recognizable by the uniformity of certain operations—in abstract reasoning on the manifestations—inductive eclecticism, the question of mental soundness and responsibility would rest. But, as every day's experience has established that it is not so, and that, spite of all modern

aids, diagnosis is still at fault, it is necessary in all humbleness to forget much of what has been written; for, however we may reverence the ability, or honor the learning of certain great authorities, we must not, in deference to them, permit ourselves to be led from real to logical relations, from particular into abstract considerations, to form general from special rules, or be induced to afford to the arbitrary combinations of their intelligence that impress of reality and unity which the contemplation of an individual case denies.

We believe that a want of harmony must ever exist between the legal and medical doctrines of insanity in its connection with responsibility. The two cannot be identical, and for this reason: Law demands a fixed rule—medicine admits but a general principle. What would be thought of the physician who undertook in the definition of any, even the simplest disease, to say, "Certain symptoms must be present?" His theory would lead to a series of disappointments, his practice be a continuation of blunders! Yet, law steps forward with her definition of unsoundness of mind; and, according to this definition, on which both the life and reputation of society may depend, one half mankind are mad, and half the mad are wise. Divest the mind of the body, establish a common standard of mind for man, and then propound a legal definition: make every question of right or wrong a simple proposition in metaphysical science; with Locke investigate the principles of our knowledge, or with Reid scrutinize the principles of our minds, and, irrespective of other considerations, let every departure from the acknowledged standard be a crime, and every crime bring its responsibility, then, and not until then, can law assume the province of the physician: while we acknowledge the humanity of man, and admit that his physical organization influences, not only the development, but also the healthy exercise of his mind; while we recognize the capability of experience to establish certain relations which every power of conception founded on that experience approves; without much violence to language or reason we may, for all practical purposes, regard those relations as necessary, and find in their study just grounds for inductions, be they on questions of medicine or of law.

In medicine, as in the other sciences, all propositions become not only untrue, but inconceivable, if necessary axioms

be disregarded in their enunciation: the chief characteristics of a sound induction being, first, its ready identification with observation of facts; and second, the capability it affords of predication. The law in laying down a fixed rule by which to recognize unsoundness of mind, as also responsibility for crime, is daily opposed by observation, and seeks to establish a dictum that would, were it acted on, lead to perpetual error: it may be presumed its hypothesis cannot be true, since the experience which its deductions afford are at variance with the reality of nature.

Though for judicial purposes no other course is practical, yet in its operation, when necessity arises, and special facts in evidence are considered, the observation of Lord Cairns in Fulton v. Andrew[1] not unusually prevails: "I should in this case, as indeed in all others, greatly deprecate the introduction or creation of fixed and unyielding rules of law which are not imposed by acts of Parliament." Merits rather than technicalities influence the judicial mind, and so bridge over many otherwise impassable difficulties.

Much of the diversity and uncertainty of opinion which pervades medical writings and characterizes legal doctrines is owing to the identification of physic with law. Insanity is, or is not, a disease! If it is not a disease, the law is strangely defective: since, as the late Dr. Forbes Winslow in his admirable writings on this particular subject has clearly and ably shown, no two lord chancellors have agreed respecting its constitution: and, not only this, but they have in their separate opinions, with considerable acrimony, criticised each other's judgments. Thus, in the trial of the case Bainbrigge v. Bainbrigge, Lord Campbell, in 1850, distinctly states, "There may be mania without delusion;" while Lord Denman, in his charge to the jury in the case Regina v. Smith, had observed in 1849: "To say a man was irresponsible, without positive proof of any act to show that he was laboring under some delusion, seemed to him to be a presumption of knowledge which none but the great Creator Himself could possess." Again, Lord Campbell, in a debate in the House of Lords,[2] after alluding to his "very long and very large attention to the subject," said "he had looked into all the cases that had occurred since Arnold's trial, 1723, and to the directions of the judges in the case of Lord Ferrers, Bellingham, Oxford,

Francis, and M'Naughten, and he must be allowed to say that there was a wide difference, both in meaning and in words, in their descriptions of the law." We may add to this, the aggregate opinion of the fifteen judges, who decided, in 1843, that "before a plea of insanity should be allowed, undoubted evidence ought to be adduced that the accused was of diseased mind, and, at the time he committed the act, he was not conscious of right and wrong." Hence, though a man be of a diseased mind, if he is conscious of right and wrong, it follows that he must be considered as responsible. Medical experience makes one part of this proposition oppose the other; and as a consequence, establishes its inefficiency; for, in the knowledge of right and wrong is merged the question of diseased mind. Those who so argue assume an antagonism, which, though not infrequent, is by no means necessary; for, while perfectly sound minds may disregard the criminality of a particular act, and deliberately say, "Evil, be thou my good;" a distinct knowledge of the criminal nature of that act can co-exist with a mind thoroughly deranged, and incapable of self-direction or control. This want of identity between legal and medical opinions occasionally inspires those entertaining conflicting views with unseemly comments, each against the other, as if men of high character in either science acted otherwise than under a sense of public responsibility and professional duty. Such are ever to be regretted. In law as in medicine, occasions arise when the limit of the knowable is reached, and judges with juries, where physicians differ, feel in reference to legal dicta—it is "the letter that killeth, while the spirit giveth life."

It would not be difficult to adduce abundant proofs of the danger which might result from receiving without question the authoritative conclusion that "nothing could justify a wrong act, except it was clearly proved that the party did not know right from wrong." "Father, forgive them, they know not what they do," was an interceding cry in extenuation of the greatest recorded crime. "But I obtained mercy," adds St. Paul, when detailing his misdeeds as a blasphemer, a persecutor, and an injurer, "because I did it ignorantly in unbelief." In accordance with these precepts, ignorance of the nature and consequence of a particular act has ever been received as a plea in mitigation of its punishment. Who will

seek to question the validity of such a judgment? It invites philanthropists to consider the condition of the uninformed masses—human animals—without the controlling influences of religion or education, and to determine what should be the relations between their punishments and crimes. While thankfully acknowledging the diminution of crime consequent on the spread of education—to say that a knowledge of right and wrong entails, on the one hand, the capability of acting according to that knowledge; or, on the other, indicates a sane state of mind in reference to those acts respecting whose nature that knowledge is evinced, and therefore involves responsibility for crime; is to contradict the dictates of medical reason, and opposed to the admitted evidence of legal experience.

It would require but little industry to enumerate a host of discrepant opinions on the subject of unsound mind, and demand less observation to establish their inefficiency; for such opinions would be found on investigation to be so far partially true, that they notice frequent phenomena which arise in mental diseases; yet to be in error, when they presume the presence or absence of any one of those phenomena, as essential for the diagnosis of such diseases.

Admitting it as for the present conceded, that the law has failed to satisfactorily meet the question under consideration, wherein rests the cause of its inability to do so? A little reflection will show that it is in the complex nature of the inquiry at issue. Accordingly, that we may be the better prepared to entertain the various propositions such investigations offer, let us institute a brief analysis of—

1st. Those ethico-legal considerations which determine the facts of criminality.

2d. Those psycho-ethical relations which are involved in the question of psychical freedom.

In their estimation of the first, the physician and lawyer may join hands, each having the same fixed rules for their guidance; since, as Lord Mansfield has observed, "Every person was supposed to know what the law is." In their opinions respecting the latter, physicians are called on to declare how far that association, which observation points out as existing between the mental and physical constitution, is adequate for the explanation of certain phenomena, attributed

to disease, but apparently identical with crime. Though it be essential that the physician have his mind thoroughly impressed with the true association between ethics and law, in order that he be the better enabled to estimate the question of mental soundness in its relation to crime; it is above all things important, that in his professional opinions he abstain from outstepping the bounds of medicine, which fully consigns to juries, under judicial direction, the appreciation of the first, while equally questioning their capability without expert evidence of adjudicating on the second.

It may, *in initio,* be observed, as a fact no less humiliating than true, that it not infrequently occurs, when the most important cases come to be decided, there is a direct antagonism in the views of "the highest authorities" on legal as on medical points; unhappily proving that the soundness of an individual's opinion is not always proportionate to the greatness of his genius. In the former, previous to those reforms which no longer permit subtle technicalities to over-ride substantial claims, justice was too often baffled by forms and procedure. Cases over-ruled, and now disregarded, show how much injury had been thereby inflicted. Judgments resting in deductions from precedents cribbed and confined within the rules of special pleading. Law in its advancing wisdom has long shaken off all such restrictions, and goes to the "very right" of matters in dispute. Can the same be said of medicine? We fear not! How numerous are the medico-legal investigations in which, even now, when life or property is at stake, the highest authorities are arrayed against each other, and conflicting opinions discredit the evidence of experts, leaving the judge to direct the jury, as his trained mind may enable him to eliminate truth.

If we scrutinize the cause of this diversity of opinions, it will appear that in many instances it has proceeded as much from the imperfect means generally applied for their elucidation, as from the obscurity of the subjects, and further, that the partial and one-sided view of nature which some have advanced, with more show of eloquence than force of reasoning, at once fails before the test of experience, and the application of those principles which, in psychical as in physical medicine, render comparison the only safe guide for the establishment of eclectic observation, or the formation of a just diagnosis.

This capability of comparison is by far the most valuable of all the aids which the physician possesses, since by it he is enabled, not only to estimate the relation an altered structure may bear to an admitted standard, as counsel determine the relation of a particular act to the known law; but also, when observing the varying phenomena incidental to the structure itself, to speak with confidence on the presence or absence of certain conditions which experience suggests as their usual, if not necessary, accompaniments. The first demands, on the part of the investigator, a perfect acquaintance with the several criteria of health as well as of disease which are applicable to all. The second implies successive observation of the individual; or the acquisition of an abstract experience, for the just appreciation of special physical and vital phenomena in their individual association, the capability of perfecting which is in a ratio to the discriminating power of the physician. These principles, as applicable to mental disease, have found adoption in the judgment of Lord Penzance in the case of Smith v. Tebbett,[3] when he approves the observation of Dr. Ray: "Compare a man with himself, his acts and thoughts now with his acts and thoughts at some previous period, when his mind was in undoubted health, you will the better detect what is morbid, than if you set up a general comparison with the thoughts and acts of mankind."

In the investigation of organic disease, with all the aids which modern diagnosis affords, a most accurate observation may prove inadequate to the solution of certain problems in which ordinary rules appear not only to be disregarded, but anomalies to exist, requiring for their explanation the inferential rather than the direct application of established principles. The causes which lead to this embarrassment it is not our province to enter on; but recognizing the fact that in identical organizations similar changes are manifested by the most diversified and conflicting symptoms, it is the less surprising that the mental constitution, which may be regarded as a series of progressive developments, should, for its due appreciation, be beset with much greater difficulties, and in its irregular operations manifest such diversity as, while altogether confounding the ignorant, too frequently present an enigma to those whose lives and energies have been devoted to the scientific study of so-called mental disease.

It will hereafter be sufficiently evident that a greater error does not exist than the supposition that the investigation of soundness or unsoundness of mind comes equally within the range of the ordinary judgment, as the determination of the criminality of a particular act when such act is contrasted with the known law. They who think so lose sight of the great practical truth that while the latter is within the reach of all intelligent men, the former, more particularly when considered in its criminal bearings, requires not only a deliberate exercise of the specially-educated intelligence, but also a competency to justly estimate the value of facts, not in their usual but abnormal relations. Wanting this capability of establishing the psychical associations of acts regarded as crimes, the frequent absence of which the records of criminal jurisprudence disclose, we are constrained to believe that life and reputation have been at times sacrificed to the erring vengeance of the law, rather than confided to the guarding care of the physician.

While this want of unity between law and medicine continues, the most that can be hoped for is as close an approximation to justice as human institutions admit of: when the fixed standard of law and the variable standard of medicine afford, in the public interest, mutual protection against impunity to acts, seemingly crimes, or their undue punishment.

Considering laws as the matured offspring of political and social science, the result of observation and experience, the perfection of reasoning on existing data, and the consummation of the conclusions which those data have afforded—we are prepared to recognize the fact that with the progress of civilization in separate countries, and the variety of relations in which men are placed with respect to each other, the data being different, the laws which they generate also vary; so much so that practices regarded as heroic and virtuous in one country would be stigmatized and held to be criminal in another. The same observation is alike applicable to each country which, as its prosperity and intellectual progress—identified as one is with the other—advance, has the effect of introducing fresh intellectual pursuits, as the study of new sciences demonstrates the wants or inefficiencies of the old. Our intellectual and social condition being progressive and dependent on the suggestions of individuals, it becomes of the

first importance that for the well-being and safety of society there be fixed principles to guide and govern the movements of the whole; the infringement of which should entail such responsibility as the well-being of the community might necessitate.

The decalogue has enumerated certain offences as entailing the wrath of God. The Scriptures have offered an unerring rule to direct the conduct of man. Were religion universally felt, and the spirit of Christianity equally experienced by all, other guides would be needless. As, however, it is not so, society has promulgated her own codes, taking as her basis that revealed principle which marks the difference between right and wrong, so identifying the moral and intellectual faculties in their co-operation. How far these exist independently, and thus correct or antagonize—how far they are identified, and so uphold and advance each other—is an inquiry which subsequent investigation shall enter on.

Human legislation has its moral and civil obligations: the former, having as their basis divine command, are unchangeable; while the latter depend for their integrity on variable foundations. It follows as a natural law that, according to our estimation of the principle which guides the greater obligation, responsibility for the observance of the several requirements of the lesser should be determined. This we find to be practically the case; for though, in the construction of all laws, the actions rather than the motives must constitute the test of crime—since it would be impossible to frame rules generally applicable to the human heart, its secrets being open to divine scrutiny alone—yet, in the individual application of the law, the act committed is of secondary importance to the motives which induced it, because the latter not only establish an accordance of phenomena as regards the act, but also indicate the intellectual condition from which the act, as the result of the conjoined mental and moral powers, may have originated.

It is for the appreciation of this intellectual condition the evidence of the physician is required—the psychical as contradistinguished from the legal or logical estimation of motives. He is not called on to declare whether an action be judicious, politic, or useful; whether the motives which prompted it be legally justifiable or otherwise; but to say, have those motives

emanated from a mind sufficiently free from disease as to argue a capability of fully exercising healthy volition, even though, in yielding to the frailty of human nature, that volition eventuates in vice; or, in following the dictates of an apparently laudable ambition, leads to the commission of acts in direct antagonism to the law?

Were medical men to regard freedom from crime as being established by virtue of the purity of motives, excellence of reasoning, or amount of good to be accomplished by acts not consonant with existing legislation, the standard of justice would be soon reduced to the narrow limits of individual opinion and all principles of rule be at an end. In their estimate of such matters physicians do not possess greater advantages than appertain to equally well-educated and intelligent men. Their duty rests in investigating, not only the relation of the act to the law, but that of the motives which originated it to the mind of the individual. The ethico-legal considerations belong to the jury; the psycho-ethical to the physician. The former are capable of being determined by all admittedly rational men, and imply—

1st. The relation of two given data—the act committed, to the known law.

2d. The estimation of the personal or other advantages or disadvantages resulting from the commission of that act.

Physicians associate these relations with a third or variable power—disease—whose proper estimation demands an intimate knowledge of principles which, so far from presenting any analogy, are, it might be affirmed, almost diametrically opposed to abstract legal dicta.

The question of criminality, simple as it may appear, is one by no means so easy of solution as first impressions would imply. If the identification of ethics and law be assumed, immorality and illegality become synonymous terms, and imply a perfection in human contrivances which, it is no very heavy reproach to say, they can never hope to attain. If, on the other hand, we permit the observance of the law to depend on the estimation of each individual, we are forcibly reminded of the observation of Cicero, that "in philosophy there was no opinion so unreasonable as not to have found some defenders;" from which it might be inferred that in popular movements no proposition could be so outrageous but many would freely

accord to its adoption. Of this, unfortunately, there are abundant illustrations. It is essential for the well-being of us all that the equilibrium of social life be preserved; and that, regarding illegal as distinguished from immoral acts as crimes, no amount of sophistry, or apparent wisdom, absolves the offender from the responsibility his conduct may entail, unless it be proved that the psycho-ethical, as contradistinguished from the ethico-legal, relations of the act were such as to warrant the belief that the offender was, at the time of its commission, laboring under unsoundness of mind controlling the healthy exercise of his volition.

This phrase must not be misunderstood. The *mens sana in corpore sano* has become an aphorism, and yet *mens* and *corpus* at times seem to have an independent existence. Insanity may co-exist with apparent physical health; and physical disease terminate life without impairment of mental soundness. By healthy exercise of volition it is desired to convey that action of the mind in which the harmonious co-operation of the faculties is preserved; mind and body in their relations being both free agents. In such a case responsibility may be fairly presumed to follow on action.

Ethico-legal considerations invite to a wide and almost endless field for discussion, and embrace some of the most interesting problems in social and intellectual progress. It cannot be denied that, friendly as ethics and law are to each other, they do not always admit of being brought into close apposition. History affords many instances in which the scaffold has become the altar where justice wept for blood shed, and offences against the law were sacrifices to virtue. Those examples, though happily being exceptions to the general rule, establishing the possibility rather than the probability of similar events, have, by some, been advanced in extenuation of acts subversive of just government, and abhorrent to right-thinking men; therefore it is all are interested in having the ethical relations of the law so fully understood that society may be guarded against the excitable and ephemeral ambition of such a class of offenders as M. Georget and Dr. Belhome have well described; with whom, as the latter observed, there is often "but one step from exaltation of mind to alienation." All must subscribe to the truth that "in policy as in architecture, the ruin is greatest when it begins

at the foundation;" the foundation of society being in its laws, public safety demands that they be maintained. The remarks of Dugald Stewart on this point are of the deepest importance to those engaged in the psychopathic study of crime. He thus writes:

"For is it at all consonant with the other arrangements so wisely adapted to human happiness to suppose that the conduct of such a fallible and short-sighted creature as man would be left to be regulated by no other principle than the private opinion of each individual concerning the expediency of his own actions?—or, in other words, by the conjectures which he might form, on the good or evil resulting on the whole from an endless train of future contingencies? Were this the case, the opinions of mankind respecting the rules of society would be as various as their judgments about the most probable issue of the most doubtful and difficult determinations in politics. Numberless cases might be fancied, in which a person would not only claim a merit, but actually possess it, in consequence of actions which are generally regarded with indignation and abhorrence; for unless we admit such duties as justice, veracity, and gratitude to be immediately and imperatively sanctioned by the authority of reason and of conscience, it follows, as a necessary inference, that we are bound to violate them, whenever by doing so we have a prospect of advancing any of the essential interests of society; or (which amounts to the same thing) that a good end is sufficient to sanctify whatever means may appear to us to be necessary for its accomplishment. Even men of the soundest and most penetrating understandings might frequently be led to the perpetration of enormities, if they had no other light to guide them but what they derived from their own anticipations of futurity. And when we consider how small the number of such men is, in comparison with those whose judgments are perverted by the prejudices of education and their own selfish passions, it is easy to see what a scene of anarchy the world would become."

From the uncertain and imperfect views entertained by many respecting the pathology of mental diseases, much of this difficulty which exists in determining the psychical relations of crime has arisen. Those who are unacquainted with the true progress or nature of insanity seek to ignore its pres-

ence unless it be accompanied by positive evidences of material disarrangement: regarding disease as an active agent whose exposition necessitates physical changes, they demand further proofs of its existence than such as are derivable from actions admitting, as they assert, of conflicting explanations. This class of observers confer an unlimited power upon organic construction, and place out of their account of causation everything beyond the material fabric. The mind of man is, according to their theory, a "principle of combination, resulting from the juxtaposition of attracting particles." This philosophy teaches its votaries to regard crime and disease as differing only by name, and leads us to equally commiserate moral ill and mental alienation, since criminality is thereby resolved into an act of organic necessity; when, as Dr. Barclay so eloquently observes, "thoughts and actions, however criminal, are, like Spartan thefts, to be held disgraceful only if detected." They who hold such a doctrine shut their eyes to the fact that intellectual freedom, which, according to their views, should be but a subtler automatismus dependent on purely mechanical arrangements, soars above those laws which regulate simple organism, and is alike manifest in conditions almost diametrically opposed. Equally in extremes there are others, who affirm the perfect independence of mind and body, and will not admit the close relationship between the immaterial principle and material organization. Such theorists in disease see only vice, and for its cure must therefore advocate exhortation alone. These, with the illustrious Stahl, contend for the existence of an invisible cause, which, irrespective of organism, is manifest in intellectual operations, and entails the necessity of seeking metaphysical explanations for numerous phenomena. The advocates of either of these extreme opinions are each enabled to adduce many cases apparently corroborative of their special doctrines: zeal supplying all that may be deficient for argument. It will be seen how far investigation has cleared up this difficulty. "Lunatick," observed Lord Hardwicke in Barnsley's case,[4] "is a technical word, coined in more ignorant times, as imagining these persons were affected by the moon, but discovered by philosophy and ingenious men that it is entirely owing to a defect of the organs of the body." Science, with its advancing experience, has prepared the way for the question which follows, almost as an

alternative proposition: "Whether," Dr. Duncan writes, "spiritual existences are really capable of undergoing any alteration in their condition at all analogous to the diseases which affect the corporeal organization, is an inquiry we are altogether incompetent to decide in our present state of existence." Wanting this capability, and admitting mental operations to be intangible, it is only by a process of analogy unusual mental manifestations can be called disease; in the treatment of which, were they immaterial, and thus beyond medical reach, the office of the physician would be of secondary, if of any, importance. Present inquiry does not call for an investigation of this disputed point, further than it is involved in the question of psychical freedom. Adopting in a measure the views of the first school, we allow the fact to be a particular truth which experience has established, that every neurosis is not of necessity a psychosis, as is witnessed in the wide class of the neuralgia, and many affections specially denoting a morbid condition of the nervous centres: on the other hand, however disposed to concede that the mind in its operations seems to exercise an action independent of the organization, we acknowledge a further fact, which observation seems to stamp as a universal truth, that without the intervention of nervous matter no indication of psychical action has, or could, become manifest. This distinction between universal and particular truths must be carefully maintained in psychical investigations, as teaching that which is true of all must be true of many: that which is true of many may not be true of one; or, again, that which is only true of many cannot be true of all: the discrimination of each case depending on experience.

Regard the mind as a distinct existence and the body as a separate creation. There are many maladies of the spirit *in abstracto*, which it is the duty of the minister of religion to treat, as also many corporeal diseases, in which the mind is wholly and altogether free; experience tells us that the mind and body exercise a reciprocal reaction, when phenomena arise which one must be content to study through their operations. In philosophy we cannot always march forward straight to our objects. It is more frequently by examining the opinions of others, and observing the grounds and causes of the mistakes which they may have committed, that we are led eventually to the truth. In the study of mental diseases

this is abundantly exemplified, for, even admitting the existence of originally independent units of mind and body, is there not that complete co-adaption of the two in the personality, which constitutes the natural or the normal condition of a particular individual? When this co-adaption becomes subsequently interrupted, antecedent to, or consequent on, the interruption of the unity must be either the imperfection of the units, or the intervention of a third cause, originating an abnormal condition when contrasted with that which had previously existed. Admit this third cause to be disease, manifesting itself in various phenomena, either those immediately tangible and referable to the physical organ of thought, or those evidenced through the secondary reactions of deficient or morbidly perverted functions; it becomes the object of the physician in either case to determine—

I. In a physical point of view, how far certain psychical manifestations are dependent on that abnormal condition termed disease.

II. In a psychical point of view, how far, in the absence of all physical manifestations, purely psychical phenomena are capable of receiving explanations.

Two questions here arise:

1. Can the existence of disease be always detected?

2. If with accuracy a certain pathological condition could be defined, would such afford sufficient ground to speak authoritatively of the influence it exercises?

In answer to the first: ordinary observation declares that the intensity of the disturbance of functions is by no means proportionate to the changes of structure in organs. For physiologists, it is difficult to believe that purely functional disorders can exist; each day discloses that inability to discover during life physical evidences of material changes is no proof that such changes are not present. The very existence of disease implies manifestations indicating organic derangement, while the best experience frequently fails to establish the presence of those changes, whose reality is at the same time inferred from the vital manifestations. Again, the sudden development of certain phenomena which have eventuated in death, has led to the discovery of such conditions as argued those phenomena to have been but the consummation of a silently progressive morbid process. In mental diseases the

physician cannot altogether reject either theory, but must learn, as Goethe tells us, "to keep within the limits of the knowable;" and, like the architects of Laputa, who began to build their houses at the wrong end, be content to study many psychical phenomena as the known effects of variable and, in many instances, unknown causes.

Supposing, as Feuchtersleben writes, that "we are acquainted with all the chemico-organical and microscopical, as well as the physical polar process of the cortical substance of the brain during the formation or reproduction of a thought, have we thereby explained thinking?" To this it may be replied: No more than the minute chemico-microscopical examination of the hepatic structure has unveiled the ultimate mystery of the biliary secretion; or an accurate appreciation of the curative powers of a drug enables one to speak with confidence respecting each change in the vital alembic which follows on its administration. We may infer from this the response to the second query, and conclude that, though pathology and physiology fail to establish certain and fixed data, they do not fail to establish the most valuable relations, the study of which is the duty of the psychologist; while, in reference to the curative means so successfully employed, physicians are cheered in their labors by the assurance thus conveyed, that the actions of man, as his most holy duty and exalted task, may be performed without requiring certainty in all the problems of human knowledge.

When Sir William Ellis observes, and others re-echo the same sentiments—"I cannot think that any act, however vicious or eccentric, ought to be considered as the result of insanity, unless it be involuntary and arising from disease of the brain or nervous system"—they make a bold statement, and one which would pre-argue a capability of diagnosis independent of the evidence of disordered function, since scientists are not, in the present state of knowledge, at all in a position to speak with invariable confidence respecting the connection of appreciable cerebral disease with unsoundness of mind, further than the fact of their coincidence. Nor can they say such a lesion must of necessity be accompanied by particular phenomena; since varied lesions are accompanied by similar symptoms, and diverse symptoms seem to result from organic lesions in every appearance identical. Neither are they war-

ranted in declaring an abnormal condition to be the cause of unusual vital manifestations, inasmuch as the researches of Andral, Dubois, and others tend to impress the belief that many of those pathological appearances may be as much an effect as a cause, having primarily a psychical origin; and, by the subsequent contingent extension of their physical alterations reacting on the nervous centres, and in turn giving rise to a new series of psychical manifestations.

The scientific treatment of mental disease leads to the study of the relations of the mind to the cerebral structure as the means through which its operations are manifested; to regard the brain as the organ of, not the seat of, thought; by reasoning on various pathological facts which experience has collected, to consider similar facts as so far important for the establishment of particular relations; and, at the same time, not to pre-argue an absence of those pathological conditions, because peculiar phenomena may not be sufficiently or prominently present. Was vitality uniform in its operations, disease should of necessity be a demonstrative science, and statistics propound a certainty in its recognition and treatment.

While there are two sources from which we derive data for our opinions, it appears that neither of them is sufficiently uniform to insure freedom from error. Nay, more, that this want of uniformity in their relations must be regarded as being, to a certain extent, a positive argument in depreciation of their separate value. It is right that it should be so. In allowing that physical signs cannot be always estimated by their symptoms, nor the importance of symptoms inferred from their physical signs, we but admit in psychopathy what is daily demonstrated in general pathology. How, then, is the physician to decide, except by the close study of the personality, and that individual application of the principles of psychical science which medical experience suggests?

It is known that for the explanation of many psychopathical phenomena the presence of physiological conditions can be adduced: we may example the morbid perversion of the senses and natural feelings, which during the period of utero-gestation is occasionally present. It is not to be presumed from this that such conditions are with all an excuse for criminal actions, though the fact be admitted that criminal acts have resulted from individual emotions identified with such conditions. Ever

since Jacob "pelled" the rods of poplar and set them before the flocks, the mysterious and inexplicable sympathy between mind and matter has received startling illustrations. A shock occasioned by a mouse has impressed the fœtus with a hairy mole of corresponding shape and size. Extraction of a tooth has been followed by birth with cleft palate and harelip; denial of fruits led to marks on the infant, swelling and apparently ripening during their season; the meeting of repulsive deformities eventuated in their corresponding reproduction: these changes being accomplished at a period of utero-gestation that proves the shock to have been immediate, and the physical changes superinduced. Is there no teaching in this; when those in apparently sound health are thus influenced through mental agency? Is there not a converse to such action? May it not be assumed that some causes originating within the system, equally immediate in action, become manifest in psychical operations, such as an impulse to destroy? Who with any show of truth can hope to solve that mystery that either or both of these phenomena involve!

Again, witness the strange consequences which long-continued local irritation may occasion, giving rise to the varied hallucinations of the hypochondriac, and placing the individual at the mercy of merely local sensations. Who, however, from this is at liberty to presume that in all cases where anomalous pathological conditions exist, the person so affected can with impunity transgress established rules? That purely physical lesions are adequate to explain many psychical phenomena all enlightened physicians believe. "There are psychological mysteries which it lies within the power of pathology to elucidate, and which would, without its aid, remain obscure. There have frequently been witnessed deviations from the perfectly correct in conduct and amiable in manners, exhibitions of petulance of temper, and trespasses against the minor moralities, to account for which, upon a post-mortem examination, there have been discovered traces of painful, and, perhaps, previously unsuspected organic disease." What inference is to be drawn from this? That in every criminal case in which the plea of insanity is raised the existence of physical disease, especially if affecting the nervous centres, is of the greatest importance to be considered.

It is needless to repeat the many experiments which have

been instituted, or the many cases recorded, in which, coincident with certain material changes or irritations, particular indications were so closely identified as to stand in the light of effects of known causes; neither would it be difficult to quote examples in which disease proceeded to a fatal termination without manifesting prominent symptoms, until such time as parts essential for the immediate purposes of the vitality became implicated. Drawing an analogy between the development of symptoms in physical, as contradistinguished from mental diseases, may it not fairly be inferred that which is true of one equally appertains to the other; and that psychical phenomena, as symptomatic of changes progressing in the nervous centres, may also remain in abeyance, until special circumstances develop their silent consummation, first prominently manifested in the perpetration of some criminal act? Every practical work abounds with illustrations of this double fact, all tending to place beyond question the necessity of remembering that though the *mens sana* may really or apparently co-exist with an admittedly disordered as well as a presumed healthy state of body, presumption must not be received as proof. Physicians are not warranted in asserting that because a mind may be apparently healthy, it is really so; or, if its operations be identical with those of disease, they are, therefore, the result of a morbid process—since many variations of conduct which in one individual must be regarded as undoubted evidence of a morbidly affected mind, irresponsible for its actions, may, in another, co-exist with and indicate a perfectly healthy state, arguing a full and undoubted possession of volition and reason: a fact which will be demonstrated when speaking of that form of mental derangement chiefly evidenced through unsoundness of the moral principle.

It is this anomaly which apparently justifies advocates, who seem to forget, and as often lead juries to do the same, that it is not in the abstract consideration, but the particular application and appreciation of principles the value of a special opinion rests. Counsel too frequently acquire their ideas of soundness or unsoundness of mind, as some do their notions of special affections, from nosological books which lay down their fixed descriptions of disease. Physicians may, on examination, admit the general truth of the one, and allow the ac-

curacy of the other. Who is there, however, who has stood by the bedside of the sick, and seen the student of the closet, but has felt that the most important part of his knowledge was wanting, in the capability of applying the information he had acquired? The lawyer is this student of the closet! It would be quite as rational to expect that the jury, if guided by his opinion on the soundness or unsoundness of mind in a particular case, should place equal reliance on his advice respecting their individual states of health, from detailing to him certain symptoms, whose value as indications of various diseases nosological works have with equal confidence laid down. This is a proposition to which few would assent; for, in their own cases, they would ignore the competency of counsel to estimate the practical application of a science which they feel satisfied must be studied in the great volume of nature, written in works not words.

Willis writes: "To constitute derangement of the mind, his aberrations must be attended with bodily indisposition." If by "bodily indisposition" is to be presumed such a derangement of the general or special functions as may be evidenced to our examination, it may confidently be affirmed the assertion is at variance with experience; though, at the same time, we freely accord to the observation of Winslow: "We are too apt to form our estimate of character, without taking into consideration all those circumstances which are known to materially influence human thought and actions. The state of the organization and the health ought to be maturely weighed before we pronounce authoritatively as to the motives of individuals, or denounce them for not acting or thinking according to what our preconceived opinions have taught us to consider as orthodox." Cheyne, in one of his highly practical essays, declares, he has no doubt that "various immoral and vicious practices ought to be ascribed to insanity." The physician has a twofold problem to decide—the relation of crime to insanity—of insanity to disease.

What does the question of psychical responsibility imply? The self-mastery of the mind in its connection with the personality, in the same way as metaphysical freedom implies the self-mastery of the mind when viewed apart from the personality. It is only that psychical freedom which is identical with health, that, strictly speaking, comes within the prov-

ince of the physician: The identification of motives with a mental condition, or the psycho-ethical relations of a particular act. Those causes which impede self-government and act morally, those faults and vices which society both promotes and punishes, constituting the ethico-legal considerations of the same act, come not within the physician's decision unless associated with this mental condition. If we admit his competency to decide on these latter, we permit as wide a range of opinion respecting each case as there may be difference in the sentiments of medical men. It is only when the diagnostic investigator discovers or presumes the existence of mental disease, for whose explanation the principles of medical science are alone adequate, that the physician should attempt to determine the incapability of being a responsible agent.

The question of unsoundness of mind in its relation to criminal acts is thus a compound or medico-legal one: Law may define the ethico-legal position as regards the act; medicine fix the psycho-ethical responsibility as regards the individual—a proposition we doubt not to fully establish, even though the greatest living jurist, Sir James FitzJames Stephen, has written: "To allow a physician to give evidence to show that a man who is legally responsible is not morally responsible, is admitting evidence which can have no other effect than to persuade juries to break the law." If the word "mentally" was substituted for "morally," would ground for the same observation exist: Is not the minor included in the major proposition?

From this a very important consideration arises. If physicians confess their inability from any one sign or combination of signs to speak confidently of the presence of disease, on what grounds do they argue to themselves superior fitness for psychopathic investigations? The evidence of "unsoundness of mind" is allowed to rest in deviations from that common standard of sanity which the general good sense has approved. Allowing the medical man to be competent to estimate the influence physical changes can exercise on psychical operations, is it in virtue of the presence of those physical changes alone his opinion is to be regarded as of value? The following cases arise. An act is committed corresponding in its immediate particulars to those ordinarily appertaining to crime: the plea of insanity is raised, and nothing but the act

under consideration affords ground for such a plea, since on the closest examination the physician can detect no traces of physical disease, or other evidences of disordered nervous functions than such as are denoted by the consummation of the act. Again, an individual to all appearance in the enjoyment of perfect bodily health is found to be suffering from an affection presumably of the nervous centre, and is declared to be, and is, of unsound mind. To the ordinary observer both are as other men. The former develops congenital predisposition—the latter first indicates latent disease by the overt act—each constituting a subtle problem in mental disease.

Does not the question in these cases resolve itself into a simple proposition—the relation of a peculiar as contrasted with an ordinary mind? We admit as much, and reply, the elements in the formation of medical opinions are not thereby affected, since the supposition that changes physically appreciable of necessity accompany insanity, is but an exemplification of a popular error, which confounds phenomena arising in with the cause of a disease; and, therefore, presumes their presence as essential in proof of its existence. The manifestation of those symptoms which originate doubt respecting sanity, may be the first sensible indication of functional disturbance; and the fact of their previous latency only be received as proof that they were not prominently developed, rather than that their morbid source did not exist.

Society is fully warranted in being jealous of her rights, and equally justified in seeking to prevent any body of professional men from assuming an authority in reference to matters affecting her interests, those matters being within her own control. Both the bar and the public are, however, deceived when they presume the general, not the particular, application of medical opinions. The question to be determined in psychical investigations is not whether certain phenomena indicate the soundness of the mind or morals of all men, but, how far they may enable physicians to estimate their relative condition in a particular individual. Were it otherwise, we should presuppose a uniformity in the mental constitution, which ordinary observation negatives. A physician is called on to declare his diagnosis; the value or nature of a certain indication is to be decided; does not his experience dictate a scrutiny; first, of the special symptoms which may

be identified with this indication; second, of the general condition associated with these symptoms? Were he guided by the first alone, it is quite possible that in a single instance he might be right, but more than probable he would usually be wrong; did he depend wholly on the latter, the presumption is, he should be rarely correct.

Where, then, does the value of special or general indications rest? In their order of progression and combination, their association with each other, and their relation to the particular habit of life, and ordinary mental constitution of the individual. In mental disease the special symptoms are the manifestation associated with some particular act, the general symptoms finding their analogues in the ordinary mental operations. The previous history becomes as essential for the appreciation of the psychical as of the physical condition. But it may be said to the physician, "Those mental operations, constituting the history of the case, are open to the consideration of all, and if this be the basis of professional opinion, where is your right to claim any advantage?" The history of the case is one thing, the capability of medically reasoning on it another; and though we do not question the logic acumen of many wholly ignorant of medical matters, yet in consequence of this ignorance, their capability of reasoning is open to the objection that they must presume variable data as confirmed; whereas it is the establishment of the nature of those data which constitutes the essence of the inquiry.

If confirmation of this view were necessary, it is supplied by the observation of Lord Penzance.[5] In doubtful cases, "the physician can reason from the certainly to the probably diseased mind, and is enabled to trace in the latter lineaments which are clearly marked in the former. Thus while the world at large can only contrast the doubtful cases with the sane, the physician has at hand the alternative contrast with the insane. It is a consequence of these alternative methods of judgment, that the question of insanity, though it falls to the lot of a legal tribunal, is properly a mixed one—partly within the range of common observation, and is so far fit to be considered by a jury, partly within the range of special experience, and in so far the proper subject of medical inquiry. It is the office of the court, then, to inform itself, as far as

opportunity permits, of the general results of medical observation, and to approach the subject on the two opposite sides thus indicated—searching for a fit conclusion by alternately presenting the parallel of sanity and insanity to the sayings and doings of the deceased."

Medicine is admitted to be a science of observation and analogy, in which experience declares that certain inferences may be drawn from the operation of different agents on organisms which nature has happily ordained should have a close similarity in each. Psychology, while being equally a science of observation, is even more so one of analogy; since the mental organism, being dependent almost wholly on external circumstances for its development, is as a consequence infinite in its variety. The standard of physical health of one is generally but a type of the same condition in many. The criteria of mental health, may, it is possible, be peculiar to the individual. Our physical constitution we admit to be influenced by a variety of circumstances over which we have no control, but whose power we can fully appreciate as more or less tending to modify the action of disease. Our mental constitution, it will be seen, while being identified with our physical, and as a consequence under the same influences, is capable of being acted on by circumstances altogether different in their nature. In our analysis of vital actions, as physically manifest, we recognize but the one undivided vital principle. In our analysis of mental vitality, as evidenced through psychical actions, we are presented with a duplicate operation of an integral power, evidenced in the intellectual as contradistinguished from the moral faculties; while, to increase the difficulty, those faculties, in many instances, seem to acquire an independent existence, since there are abundant proofs that not only may one be exercised irrespective of the other, or harmonize with the other, but it is even quite possible that in their separate operations they may, to all appearance, seem directly antagonistic.

If, in the diagnosis of physical disease the history of the case is regarded as essential for showing the order of development, combination, and progression of indications whose aggregation physicians are required to determine; how much more important is it, that in mental disorders all previous circumstances be not only fully investigated, but fairly estimated,

for determining the influences they may have exercised on the several faculties.

It is known that in the physical organization, unless certain functions be duly performed, deviations from the admitted standard of health become sufficiently manifest to constitute disease. Mental operations present, however, innumerable deviations from the approved standard of sanity, and they cannot be received *per se* as evidence of disease for this reason, that the mental constitution having no fixed standard, the conclusions of two minds, admittedly healthy, may be diametrically opposed, and, owing to the capability of independent action which appears to be exercised by the moral and intellectual faculties, the actions of a sane and insane mind be perfectly identical, contradistinguishing moral crime from disease. Unless, in such investigations, the physician be habituated to question with accuracy and to reason with caution, he is open on all sides to an infinity of complications from which error may rise.

In physical diseases there are generally visible or tangible evidences by which to recognize change of the organism. In psychical affections we can have no means of estimating the character of any mind except through its operations. It is, therefore, essential, for all undertaking such investigations, that they be possessed not only of distinct criteria by which to define the mental health of the individual, but that they be also fully competent to estimate those various agencies, which, apart from physical influences, act or react on the particular mental constitution.

We have said "apart from physical influences," for we wish it not to be forgotten, that the physician is alone competent to speak authoritatively in cases where the immediate instrument of thought is involved. We have now, further, to contend that physical causes, altogether remote from the nervous centre, notwithstanding their apparent isolation, are still capable of powerfully influencing its operations, and in a measure modifying their character. Action and reaction are not only to be observed in mind as well as matter, but between mind and matter. It is a mystery involved in the very fact of our existence that such should be the case, since the closest investigation has resulted in no further discovery than that it is so. We are not competent to decide respecting the gov-

ernment or direction of these interchanges of action, since the same apparent physical causes may coexist with perfect mental health in one, and in another be identified with, if not the cause of, a directly opposite condition. This fact it is which occasions their presence to be ignored by many who are incapable of duly estimating them.

Surely, it will be said, crime is not clothed in such deceptive robes, or sanity so enveloped in mystery, that fine-drawn subtleties are required for their exposition—Who would not know a villain, who could not recognize an insane? The supposed villain is, however, too often the insane, who finds in the guarding care of medicine his only sympathy or protection!

If it be contended that medical men are so pre-eminently adapted for such intricate investigations, and it be conceded that cases may arise in which the psychical estimate of crime involves many abstruse and difficult considerations, it may be asked, "Why are other than medical juries empanelled to adjudicate on such matters?" To this we reply: There are many grave and fitting reasons that the existing state of the law should be maintained. Were medical men required to primarily decide on the soundness or unsoundness of mind of an individual accused of crime; unless their opinions embraced the act originating the accusation, their adjudication would be altogether unjust; for that act might be the hinge on which their estimate of sanity should turn. If, on the other hand, they include the act, the onus of proof respecting the guilt or innocence of the party accused is thereby placed in their hands, and we have no grounds for inferring that, under such circumstances, greater unanimity would prevail than is seen in their evidence before the ordinary tribunals. Were they to assume the act as committed, they should thereby identify the question of the accused's sanity with that of his criminality. These, and many other reasons which might be adduced, lead to the belief that determining guilt or innocence by the voice of the jury, the soundness or unsoundness of mind by the opinion, after careful examination, of the physician, both subject to judicial criticism and direction, is the course best calculated to maintain public confidence and insure public safety—views we are glad to believe now acted on in the most important medico-legal investigations.

We have not in the foregoing observations sought to deny the capability of a jury in many cases deciding from facts the presence of unsoundness of mind. In psychical as in physical diseases illustrations arise in which broad and distinct differences exist, denoting an unhealthy or altered condition. Common sense may as frequently pronounce the wit diseased, as the man without surgical knowledge diagnose the fractured limb. It is not to such examples our remarks apply. The public generally are unsuited, if not incompetent, to entertain many considerations psychopathic investigations entail. Even allowing they could divest their minds of natural prejudices, and with all honesty and earnestness seek by the most patient scrutiny grounds for their verdict, what does it amount to? The coincident opinion of intelligent men, who, it may be, decide an important question on the observation of an individual case, and thereby declare their capability of fully appreciating the various phases of a most intricate disease. Every mind has its own standard of mental and moral health, by which it is too apt to adjudicate on that of another. When men repudiate the conduct of another, they identify the feelings of that other with their own. They are conscious that certain deeds should with them indicate particular mental states, they therefore presume they can appreciate the same causes in another through their effects. In many particulars a diseased mind accords with their own—they, in consequence, refer the same capability to that mind. First starting with a proposition which they assume as correct, they then demand that you question not its truth; for, judging as they themselves feel, they decide as they judge. To those we would speak in the words of him who, though one of the greatest reasoners of any age, was not in virtue thereof devoid of error: "He that would not deceive himself ought to build his hypothesis on matter of fact, and make it out by sensible experience, and not presume on matter of fact because of his hypothesis."[6]

On most trials matters of fact and matters of opinion are submitted to a jury: the value of matters of fact may be open to the judgment of all—the value of matters of opinion must be proportionate to the capability possessed of forming that opinion. The question of unsoundness of mind in its relation to responsibility for a criminal act may rest on admitted mat-

ters of fact, by which it is possible the jury may decide the issue; but, when those matters of fact come to be estimated in their presumed morbid relations, they are thereby converted into matters of medical opinion, when, as Hoffbauer has remarked, "the court should not hesitate to be guided by the same." When, therefore, we read such observations as have been attributed to the Lord Chancellor Truro and others, the former of whom is reported to have declared—"His experience taught him there were very few cases of insanity in which any good came from the examination of medical men. Their evidence sometimes adorned a case, and gave rise to very agreeable and interesting scientific discussions, but, after all, it had little or no weight with a jury;" we cannot, under such circumstances, regard the rejection of truth derived from experience as being other than tantamount to the adoption of error, and cease to wonder that even among the most able minds charlatanry should occasionally find acceptance. In the interests of humanity we are glad to record that judges of greater eminence have expressed far different opinions.

Justice demands that the grounds on which insanity be received as a plea for exculpation from punishment, or as a pretext for exclusion from social rights, should be as uniform as possible. We admit the difficulty of defining insanity; and yet, to recognize an insane person is a matter for which the majority of mankind believe themselves fully competent. We shall not attempt the former, but rather essay to offer suggestions which may at least tend to more fully demonstrate, and thereby, it is not impossible, diminish the obscurity of the latter.

It unhappily requires but little observation to perceive that crime and insanity have many features in common. The records of the one may be regarded as furnishing the most marked examples of the other. Although the illegal acts of the insane are ever far removed from that criminality with which they may appear as identical, it is, in many instances, no light undertaking to draw the line of demarcation, or to say what distinguishes iniquity from folly. We have repudiated the supposition that in psychical operations, similar manifestations must of necessity indicate uniformity of causation, and have affirmed that eclecticism is the only safeguard in psychopathic medicine. This will be exemplified in the study of cases to be subsequently detailed.

We may for the convenience of description state, that

most, if not all, insane criminal acts are capable of being ranged under one of the following divisions.

I. Crimes against the state; II. Crimes against the person; III. Crimes against property.

The mental conditions which originate such acts are also reducible to a similar number of divisions:

I. Insane states manifested chiefly by delusion, or what has been termed "monomaniacal insanity," in which the intellectual or reasoning powers seem to be those more particularly involved.

II. Insane states in which the exaggeration or perversion of the moral intelligence or effective faculty is that most evident, constituting the "moral mania" of writers, when the intellectual powers are apparently unaffected.

III. Insane states in which neither the moral nor intellectual faculty is of necessity inadequate to appreciate the relations of a particular act, whose commission is alone explicable on the admission of an irresistible impulse—a form of disease described as "impulsive insanity."

In proposing such a division we seek not to establish any absolute connection between a special form of crime and a particular development of insanity, inasmuch as it will be evident that criminal acts capable of being ranged under one of these three divisions, or embracing the whole three, may find their plea of extenuation in either of these insane conditions.

In proceeding to the practical investigation of unsoundness of mind in its legal and medical considerations, we enter on a subject of general as well as special interest. Every psychopathic inquiry entails a deep and solemn responsibility: while we wish not to exaggerate, it would be equally unjust to speak lightly of its difficulties. Character, friends, and fortune, on such occasions, may be at stake. All are, therefore, particularly interested in establishing and upholding the most complete justice for the insane. Who is exempt from the visitation of disease? Confined to no class, identified with no position, peculiar to no country; old and young, rich and poor, learned and ignorant, our neighbor and the stranger, are alike within its reach. Protean in its shapes, insidious in its approach, direful in its effects, blighting its victim, and spreading desolation around, insanity, while isolating man from his fellows, appeals to their warmest sympathy, and at the same time honors medicine, by intrusting each wavering mind to her special care.

CHAPTER II.

MONOMANIA.

Monomania may be defined as a morbid mental condition induced and characterized by an habitual recurrence of similar thoughts which eventually concentrate in one fixed idea. In this disease the mind, as Reil well expresses it, "suffers a paralysis of its powers of conception," and is thereby rendered inadequate to appreciate the general or special relations of some particular point round which its thoughts, as it were, revolve. The causes conducing to this form of disease, though endless in their variety, present a certain uniformity in their results. It matters not whether the thoughts those causes engender be of a religious, political, or scientific nature; whether they have reference to the past, the present, or the future—the essential characteristic of the affection by them established is still preserved. The mind becomes morbidly impressed with certain suppositions, and is as a consequence rendered incapable of the healthy estimate of those relations to which such suppositions refer.

The study of monomania offers for consideration many of the most anomalous problems in psychology, since individuals whose minds are on some one point thoroughly deranged, may, as regards other matters, not only manifest extraordinary energy and acuteness, but also, while admitting the peculiarity of, defend their abnormal suppositions, with arguments requiring for their exercise considerable logical acumen. Fully competent to detect, they will even ridicule absurdities and peculiarities in others, which are trivial in comparison with those habitual to themselves; and thus, by the display of much intelligence and discrimination, frequently succeed in concealing the real condition of their own minds; rendering it in such cases difficult to conceive why a capability for the disposition of property, or responsibility for acts other than acts arising from the delusions, should not appertain to those so

afflicted. Such cases constitute the crucial tests of psychical science.

Psychical and physical diseases for their estimate present a perpetual contrast. The greater difficulty experienced in the diagnosis of the former may be ascribed to this contrast. In the physical constitution of men a certain uniformity of structure is visible, any departure from which is immediately appreciable: corporeal actions being regulated by recognized vital laws, the criterion of physical health rests in the harmonious adaptation of the one to the other; when this becomes interrupted, proportionate to the importance in the economy of the function impaired, is the disturbance which ensues; in the mental constitution the same facility of recognizing abnormal conditions by no means exists, since the standard of mental health cannot be equally well defined. Abstractly considered, the evidences of mental disease in one person may be identical with the healthy and ordinary exercises of another, as a consequence of which, for their differential diagnosis much difficulty and doubt in such instances is experienced. It becomes, therefore, a matter of serious importance, when cases arise in which the existence of insanity is based on arguments explicable by the dictates of reason, that society be preserved from the danger which might result from the too easy reception of such a plea; while, at the same time, humanity be exculpated from responsibility for those sad operations of disease which, it is possible, may eventuate in the natural disposition to crime being more prominently, because morbidly, developed. In obscure physical disease, the keystone of diagnosis is the history of the case; yet, with all the evidences and aids which modern medicine can bring to bear for its elucidation, how often must caution regulate opinions, while prudence temporizes treatment. In mental disease, and in this particular form above all others, unusual difficulties demand increased care for their exposition. In many judicial-psychical questions the physician must, as Kant observes, "call the philosopher to his aid," since not only does it behoove him to estimate the psycho-ethical relations of certain mental manifestations, but also to determine the relation of those manifestations to the personality. What does this require? Not a hasty visit, not the mere listening to a simple recital of apparently anomalous facts, not such a melancholy display as has been witnessed on

some trials, where medical men without experience in insanity, and with but imperfect opportunities for observation of the case under adjudication, have volunteered their evidence: but —that deliberate investigation, indicating anxious experience, which scrutinizes the individual character, the progress, order, and combination of symptoms, their relations to the psychical and physical constitution, and gives as the result of their conjoined evidence a definite and matured judgment. Certainty in knowledge is not permitted to man; the most we can, therefore, hope to accomplish is, to limit fallibility within narrow bounds. In psychical as in physical disease this is sufficiently evident; since, while admitting that every concession to crime may be regarded as an exaction from justice, cases will arise in which the conflicting evidence adduced renders it a merit to doubt, though the humane spirit of our legislature affords to the individual accused of the most flagrant crime the benefit of that doubt. It has been observed that the standard of mental cannot be equally well defined as the standard of physical health. There are many facts which strengthen this opinion; they rest on ordinary observation of life. Coleridge truly wrote: "Society would be broken up, and man would loathe his brother man, if the secrets of each heart were laid open to public gaze." This affirmation must be conceded. As we write not to depict the follies of the day, and are not of those who consider a knowledge of human nature to signify an acquaintance with the mere vices of mankind—though it is true that such information is essential for a just estimate of humanity—we shall not pause to give extracts from a book in which each one may read; yet, on the analysis of the heterogeneous mass of which society is composed, we cease to be surprised that many are found content to acquiesce in the sentiments of others, be they monomaniacal or otherwise, rather than to reason for themselves; to manifest a sensibility in their detection of trivial faults, and an equal incapacity for their recognition of great merits; to show in their estimate of one class of offences temerity and fastidiousness, which contrast strangely with their appreciation of another; to exaggerate the importance of knowledge scarcely available; and to undervalue, if not deny, the existence of those peculiarities which proclaim their own inconsistency.

The complex nature of the question under investigation

renders it essential to fully appreciate the various sources from which the elements of a just psychopathical opinion are derivable. These may be enumerated as follows:

I. Study of the general and special relations of the individual affected.

II. Analysis of his mental and moral constitution in their mutual reactions.

III. The relation of the monomaniacal conception to the foregoing.

Society has imposed certain observances and rules to regulate and direct the association of its members. The necessity for such is at once apparent on consideration of that want of uniformity in the intellectual and moral constitution of man which is on all sides visible. The basis of these regulations may be regarded as resting equally on the ethical as well as the psychical perceptions of men—their object being the social assimilation of one to the other; their end, the establishment of order and preservation of good-will. Public opinion, that is, the aggregate expression of individual sentiment, has therefore at all times been a legitimate object of honorable ambition. Its disregard indicates a desire to establish an independent standard of excellence, which seldom fails to bring its moral penalty in the forfeiture of that confidence essential for the enjoyment of the proper mind. It is not by this meant to imply that men are to pander to the follies, acquiesce in the weakness, or comply with the absurdities, fashion may require —far from it! These are too often but the gaudy toys with which conventionality seeks to divert the judgment of sober reason. We have little hesitation in declaring that those obligations of society which good sense has dictated, and experience approved, as promoting individual comfort by maintaining among its members mutual respect, cannot be altogether despised; without leading us to question the stability of the intellect, as well as the purity of the morals, of those who have the hardihood to so act.

Society demands conformity to her established rules, and is jealous of each innovation in her code. Not but alterations are being continually introduced, fashions changing with the season, manners with the age. The universal judgment of men recognizes, in the compliance with those usages they may have approved, a definite and known state of mind re-

specting which they are adequate to form an opinion, and accordingly presume on their capability of appreciating the relation the same state of mind should have to circumstances which they are not so competent to estimate. From the coincidence of action in one position we identify the animus of another with our own, and are, consequently, apt to refer their several actions to the test of our individual consciousness; and, being satisfied that, under similar circumstances, the performance of a particular act would be entirely contrary to our feelings or disposition, we cannot, therefore, account for their occurrence on any reasonable principle, and seek to explain the difficulty by assuming derangement of either the moral or intellectual faculty.

Sir William Ellis observes: "In a state of sanity the various feelings and propensities are kept under control, partly by their mutual influence upon each other, partly from moral causes, and partly from the restraints imposed by society. When careful education and religous feeling have rendered their due regulation habitual, strong propensities may exist unknown and unsuspected except by the individual." This preservative influence of society is exercised in many ways, not the least important of which being the habit of self-control it engenders. "Habit," it has been well observed, "is second nature." Dugald Stewart, in reference to custom, writes: "It is one of those natural instincts which no reasoning or process of thought is able to either produce or to prevent." Habitual self-control affords, next to religion, the surest guarantee for mental and moral health, since temptations successfully resisted in the end become powerless, while vice with each succeeding indulgence acquires additional force, until at length the "still small voice" of conscience ceases altogether to be heard.

Goethe, in speaking of society, observes: "Nothing brings us nearer to insanity than distinguishing ourselves above others; and nothing preserves the even tenor of the understanding so well as a general intercourse with many people." Thus it is that society contains within itself resources for its own protection: were it not so, ambition would be wholly without regulation, and the mind, in subjection to its innumerable impulses or passions, proportionately suffer. In society is chiefly to be found the reaction of one mind on another, the

beneficial effects felt to be derived from congeniality of sentiment, which insensibly influences if it does not wholly determine our associations; together with that mutual encouragement and assistance, which enable the intellect to bear up against the most gigantic exertions. Whether in the extended field of politics, or the narrower sphere of professional life, it is this mutual co-operation and reaction which accomplish great events either for governments or science, and preserve at the same time the standard of excellence with the equilibrium of sense. It may be observed, that when men undergo a similar amount of mental toil, being isolated from their fellows and wanting this insensible regulation, their minds are, under such circumstances, prone to suffer accordingly; when either some one idea acquires a mastery which, uninterrupted, becomes so deeply rooted as to influence their whole subsequent career — actual monomania resulting; or, the thoughts in their continual reaction revert on themselves, when but trivial circumstances are required to develop some special indication of a more general insanity.

A physiological observation of men has established a fact of importance to be remembered. Certain psycho-physical differences appertain to some individuals, which enable them to apprehend the exterior world in a manner peculiar to themselves alone, and to react on it. It would be easy to enumerate examples of special physical constitutional peculiarities or idiosyncrasies in many, which not only co-exist with the enjoyment of sound health, but whose very interruption indicates the presence of disease. Observation proves an analogous condition to as frequently exist in the psychical constitution, when it becomes a matter of the very greatest importance to distinguish those peculiarities and idiosyncrasies of feeling and thought which specially appertain to particular individuals, from similar conditions of feeling and thought which may in others be most valuable as denoting the presence of disease. In the majority of instances it needs but little ability to recognize that which, for want of a better name, is termed eccentricity. A single interview is often sufficient to establish the opinion that much individual peculiarity exists; it would, however, be shallow philosophy and dangerous practice to regard such as indicative of unsoundness of mind. We do not believe that any experienced physician would do so,

since it is the continued observation of successive phenomena in the same individual which enables him to arrive at their true appreciation. A particular act, or succession of acts, to acquire value as a symptom of insanity, must do so through the fact of its denoting a departure from the natural and healthy character, temper, or habits. It is not, therefore, sufficient that the medical man who would determine the question of soundness or unsoundness of mind be informed of special acts which he contrasts with what he may regard as an approved standard of mental health, but it is requisite that his standard be the admitted mental health of the individual, that the acts specified may have their value determined accordingly; since, to quote the words of Dr. Gooch, "it is the prolonged departure, without adequate external cause, from the state of feeling and modes of thinking usual to the individual in health, that is the true feature of disorder in mind." Ordinary observation is sufficient to confirm that it is the relative appreciation of an act which determines its value. What is our test of sanity? Are we of the school of Chrysippus, "which deems every man mad whom vicious folly or the ignorance of any truth drives blindly forward?" Is the departure from a fixed rule, or the acquiescence in established usages, one way or another, to determine our opinion? Both of these questions invite to discussion. Folly and ignorance must ever be distinguished from crime and iniquity, to which, however they may predispose, they are not of necessity allied: originality of thought must not be confounded with that which, in its ordinary signification, we term "singularity," since its manifestation may be the most convincing evidence of superior intelligence. It cannot be denied that in all countries where intellectual activity has been awakened, one of the most powerful agents in the wise direction of human events is the tendency of original thought to differ from general opinion; when, living, as it were, in advance of their age, master minds have disregarded those narrow bounds within which routinism would restrain the most splendid genius. Universally it will be found that the greatest triumphs of the human mind have been accomplished in direct opposition to the current of general opinion, and that public thought in one age is not infrequently but the echo of solitary meditation in that which had preceded it. If proof be required of this, we

have but to look to the social as well as scientific revolutions which have within the last few years been perfected; or, to regard those many mighty undertakings which, throughout the civilized world, are at this moment being carried out. The doubt as to what may be accomplished, and the detail of what has been effected, place the same question in a very different light. At no period should scepticism be more thoroughly in abeyance than at the present, when the very elements are subservient to the will, and the wish but the prelude to the act. No proposition must therefore be rejected because it is new. How many men have foreshadowed truth while propagating supposed errors which enveloped and developed the most profound discoveries of their succeeding age?

There are innumerable examples of mental gifts, or congenital endowments, which place certain men in immeasurable advance of their fellows. Their intermediate stage of education and development appears to be passed in a bound. At an age in which study and observation can have had but a small part, examples of extraordinary capacity are found above and beyond their associates, who have been subjected to the same guidance and influence. In science and art, phenomenal genius possessing intuitive experience has enriched mankind by discovery or astounded by performance. The world is the wiser and the wealthier for such. By what standard are they to be judged? From the days of Galileo to this our time, theory and experiment in philosophy and science have brought the so-called "mysteries of nature" within the range of exposition or demonstration. The common knowledge of to-day would have been regarded as visionary and its illustrations as miraculous by the philosophers of former times. Are we wiser men, or only wiser in our generation? Who will attempt to define onward progress, or say when its limits will be reached?

It may not be inappropriate to here briefly review the past so far as it bears on the subject under consideration. A phase of mental disturbance, as evidenced in public credulity, has within the last thirty years become more particularly developed. "Spiritualism" has had crowds of converts: professors of its art and mystery thriving on the ignorant susceptibilities of the multitude, to the great disquiet of weak-minded believers in the supernatural. The action and reaction

of psychic-force evoking nervous sympathies in excitable temperaments, has, in many, produced hysterical-cataleptic results appreciable by the physician, but to the uninformed full of mystery, as so-called "mesmerism" revealed susceptibilities but little understood by the ordinary observer. "Animal-magnetism" has illustrated the controlling power of one mind over another and the subordinate action of the physical to the mental constitution, which to the ordinary observer seems inexplicable; "clairvoyance," in which Providence is believed to impart a power of divination, either to some member of the great unwashed, or to a more pretentious "medium," for the purpose of exhibition to the multitude at one shilling a head, or a higher scale according to means, has had its believing followers; "planchette," through its involuntary writing establishing communications with the absent or the dead; "table-rapping," with its code of interpretation, have both found willing dupes to bow down and worship at the shrine of charlatanry, offering in some instances as evidence of their belief all their worldly possessions. These things done openly, from their effrontery and publicity have been suffered to go unchallenged, in the hope that common sense would prevail. There has happily been one exception known as the "Huddersfield Spiritual Case,"[7] where the professor was convicted as a rogue and a vagabond, and sentenced to three months' imprisonment with hard labor, for doing that which men of light and leading had hesitated to denounce as proceedings deserving of ridicule and contempt. An appeal to the Superior Courts has placed on record the judicial decision. Francis Ward Monk, in his attempted flight from justice, left behind him his instruments of trade, gloved models of the human hand, elastic tapes and wires, phosphorus, and other accessories. It is to be hoped on the termination of his term he was a wiser if not a better man. An illustration scarcely less ludicrous occupied our Equity Courts. Mrs. Lyon, a wealthy widow aged seventy-five, found in Home, a spiritualist, one worthy of her adoption as a son. Home had placed her in direct communication with "her dear husband," who, from the other world, informed her he was "happy, happy, happy," and added that he "loved Daniel (*i.e.*, Home) as a son, and he was to be her son." In compliance with the direction so conveyed, and further wishes similarly expressed, Home was

adopted and endowed with many thousands of pounds conveyed by deed. Business called him from the widow's side. During his absence, jealous expectants improved the occasion. A rival medium was introduced, the dear deceased, less happy, through the new intervention denounced Home as an "imposter," and in a mundane spirit, unworthy of Paradise but nevertheless practical, advised proceedings at law. This advice was also followed. By the decree of the court the money was ordered to be restored, and to the credit of Home, who had it under his absolute control, let it be recorded that such was done. The public was informed of the views of the judge, Vice-Chancellor Gifford, who thus spoke: "I know nothing of what is call 'Spiritualism' otherwise than from the evidence before me, nor would it be right that I should advert to it except as portrayed by that evidence. It is not for me to conjecture what may or may not be the effect of a peculiar nervous organization, or how far that effect may be communicated to others, or how far some things may appear to some minds as supernatural realities which to ordinary minds and senses are not real. But as regards the manifestations and communications referred to in this cause, I have to observe, in the first place, that they were brought about by some means or other, after and in consequence of the defendant's presence, how, there is no proof to show. In the next, that they tended to give the defendant influence over the plaintiff as well as pecuniary benefit. In the next, that the system as presented by the evidence is mischievous nonsense, well calculated on the one hand to delude the vain, the weak, the foolish, the superstitious, and on the other, to assist the project of the needy and adventurous; and lastly, that beyond all doubt there is plain law enough to forbid and prevent the retention of acquisitions such as these by any 'medium,' whether with or without a strange gift, and that this should be so is of public concern, and, to use the words of Lord Hardwicke, 'of the highest public utility.'"[8] This judgment proved social death to such exhibitions. They ceased to be fashionable, and were accordingly denounced. Home became the guest of foreign courts, where he continued to find favor in the eyes of many. These are but two instances in which the veil of imposition was rent and frauds of no mean character exposed, and yet "the great spiritualist" had, and

continued to have, numerous influential patrons and friends, who lent willing aid to that they wished to believe, accepting as truths the subtle outpourings of self-constituted speculators in mysterious revelations, for the better trading on the superstitious weakness of mankind and the deceiving of many.

It is scarcely necessary in a work professing to treat unsoundness of mind as a scientific question to affirm that crucial tests, within the comprehension of the most ordinary capacity, have been applied to clairvoyance, spiritualism, and similar conditions alleged to endow with exceptional powers, without in one single instance a satisfactory result for those interested in the frauds. "Thought-reading," the most recent of exhibitions, is omitted from the foregoing as puerile and harmless for an evening entertainment.

It is much to be regretted that these pernicious teachings have not been limited to the more humorous impositions on the public in dark or open séances, in sounding instruments or floating figures, or the less mysterious demonstrations of burly scoundrels tightly corded, who within a press are unbound by spirits. The same doctrines have found expression in a sensual religionism to which property and purity are alike subordinated, and the principles of free love preached and adopted. The case of Nottage v. Prince[9] (Bridgewater Agapemone) illustrates how far that hysterical exaltation of mind to which women are so often liable can be utilized by saintly adventurers for their own benefit. It is not, however, necessary to rely on so recent a decision or to quote the judgment of Vice-Chancellor Stuart in 1860, in order to express the judicial opinion which happily prevailed respecting "men whose canting and whose doctrines have no other tendency than to plunge their deluded victims into the very abyss of bigotry, despair, and enthusiasm. Men who go about, in the apostle's language, and creep into people's dwellings, deluding weak women. Men who go about and diffuse their rant and enthusiastic notions to the destruction, not only of the temporal concerns of many subjects of this realm, but to the endangerment of their eternal welfare. And shall it be said that this court cannot relieve against the glaring imposition of these men? that it cannot relieve the weak and unwary, especially when the impositions are exercised on those of the weaker sex?" These are the words of Lord Chancellor

Northington in the case of Norton v. Relly,[10] decided in 1764. They leave no opening for addition or amendment.

It would seem that belief in the supernatural changes but its form of credence. Witches yesterday—mediums to-day. As recently as the early years of the present century witchcraft had its numerous believers. The Mosaic law, "Let not a witch live," was cited as proof of their existence. Sir William Blackstone writes: "To deny the possibility, nay, the actual existence of witchcraft and sorcery, is at once flatly to contradict the revealed Word of God in various passages of the Old and New Testament, and the thing itself is a truth of which every nation in the world hath in its turn borne testimony either by example, seemingly well attested, or by prohibitory laws, which at least suppose the possibility of a commerce with evil spirits." Sir Matthew Hale, in a trial of witches at Suffolk in 1665, stated in the course of his summing up to the jury, "that there were such creatures as witches, he made no doubt at all." Pope Innocent VIII., in 1480, had issued a bull for "the discovery and burning of witches." In the fifteenth century there seems to have been a wholesale massacre of those who were believed to hold communication with the powers of darkness. Especially so was this manifest on the continent of Europe. In the year 1515, 500 witches were burnt at Geneva in three months. In 1525, 1,000 were burnt in the diocese of Como and 100 per annum for several years. From 1580–95, 900 were burnt in Lorraine. England took a more moderate part in such atrocities, and yet they were no greater than those that, in the name of religion, had been inflicted by professing Christians one upon the other who differed in matters of doctrine. So great did the public interest continue in the witch question that James the Sixth of Scotland, in 1597, published a work on "Dæmonology," and, writing no doubt his royal experience and research, thus proceeds: "Witches are not generally melancholic, but some are rich and worldly wise, some are fat and corpulent, and most part are given over to the pleasures of the flesh; and further experience daily proves how loath they are to confess without torture which witnessethe their guiltinesse." The royal reasoning and inference are worthy of the subject, and are no doubt as reliable as his Majesty's description, which is most disquieting, for if witches still be, one must be cautious how they join pleasant company.

Knowing that ridicule is no argument, it is yet difficult to treat these questions with the seriousness they deserve. The huckstering of supernatural revelations for small coin, or accrediting relations with Satan to visionary fanatics who make market of ignorance and superstition, is too absurd to discuss. Facts, however, must be accepted as the proof and record of the times. It is to be hoped that witchcraft and its kindred manifestations have with the Cock Lane ghost become matters of tradition, and that the next public craze will appeal to the higher rather than the weaker sensibilities of humanity. There is much teaching in this retrospect. As late as the year 1800 supposed witches were in England subjected to the "ordeal." In 1785 a woman in Northampton was swum for a witch, her thumbs and great toes being tied together: to the ordinary sense such a process would appear not favorable to natation. She fortunately escaped. In 1759 Susannah Hannokes was in church, regarded as the public court for the trial, in the presence of her accuser and an assembled crowd, weighed against a Bible, and being the heavier escaped with her life. These incidents of the past are sad to read, and yet great and gifted men then lived and ruled the councils of the nation. What test or definition of delusion should have been applied to them? Or were they but wise according to the light that was in them? light on such matters but sufficient to make darkness visible. ("Side-Lights of the Stuarts," by F. A. Inderwick, Q.C., has a chapter on witchcraft which exhausts the learning on the subject. To it the author of this work is much indebted.)

These illustrations may be regarded as but so many social occurrences, which, however indicative of ignorance or weakness, leave untouched the great question of insanity in its graver personal relations. They offer much matter for reflection when asked to regard men either as sane or as irresponsible because of the apparently absurd belief or opinions they either entertain or express.

Occasions arise when the nicer points of diagnosis which distinguish credulity and superstition from mental unsoundness are of the first importance, especially so when dealing with the social status of those mentally afflicted. It is important to note the principle regulating lunatics in their civil as distinguished from their criminal relations. The former

have associations and associates which demand equal considerations with the sufferer. Sir William Grant, M.R., held:[11] "A Court of Equity will not interfere to set aside a contract overreached by a commission in lunacy, if fair and without notice, especially where the parties cannot be reinstated." This judgment has since prevailed. Nor is lunacy an answer to wrong-doing in other actions, except the wrong complained of is incident to and part of the lunacy. Again, it was fully argued before the House of Lords in Mordaunt's case (a divorce appeal), the judges being in attendance, and determined that "though a respondent be of unsound mind and unable to plead, divorce might be asked for and decreed on behalf of or against a lunatic, the court appointing a guardian *ad litem* for protection." In this case it was conceded that the allegations in the petition referred to a period antecedent to the supervention of mental incapacity, and that the respondent, at time for pleading, was of unsound mind. It was argued that divorce was a quasi-criminal proceeding, the defence of which might be presumed to mainly rest on the evidence of the respondent. Lord Hatherley, expressing the opinions of the majority of the law lords and judges, declared "by the law of England, adultery, though a grievous sin, is not a crime, and the analogies and precedents of criminal law have no authority in the Divorce Court—a civil tribunal." Further adding, "in the proceedings against a criminal every step is arrested by his or her becoming a lunatic, but the proceedings in divorce is not a criminal proceeding." The views of Sir Henry Keating and Sir Lionel Brett, that "proceedings may be instituted but not continued against a lunatic after the lunacy has been duly found, and that a lunatic cannot be a petitioner for a dissolution of his or her marriage," being opposed by Sir Fitzroy Kelly, C.B., supported by the majority of the judges, on the ground of personal right, expediency, and public policy. Which judgment prevailed as against the technical exposition of Clauses of Divorce Act affecting the respondent, and the powers therein given to plead and tender evidence, in favor of which the minority had expressed strong opinions.

On most criminal trials many simple, logical, or ethical propositions are put forward, and the jury thus become, as it were, personally identified with the replies of the medical witness, whose value they estimate according as they may

correspond with or differ from their several sentiments; whereas the matter to be determined is not, Does the presence or absence of particular manifestations indicate the soundness or unsoundness of the mind or morals of all or of most men? but, How far the presence of these special manifestations indicates the mental or moral condition of the particular man? If we admit the general application of such a question, we should premise a certain and fixed standard of mind, and an inquiry would arise respecting the mental soundness of any two men entertaining opinions diametrically opposed. Bacon rejected the theory of Galileo with scorn: who would impugn the sanity or wisdom of either? The more limited application of the proposition leads to the special examination of each case, when, as in the diagnosis of physical disease, the application of general principles by no means implies the adoption of a general rule. Had we but a moral intelligence, no doubt respecting our opinion could arise, for our moral standard is fixed, and does not, therefore, admit of being disputed. Every vicious man should then be considered insane, as acting against the first law of nature in consummating his eternal destruction. The difference between right and wrong admitting under such circumstances of no dispute, insanity and vice should be identical; that is, supposing that, in the absence of a reasoning process, either was possible, which we by no means admit, inasmuch as our movements, wanting the elective power of the intelligence, would be purely instinctive. The compound nature of our mental organism, however, disarranges this simplicity. The moral is at fault —the intellectual extenuates; the intellectual errs—the moral puts forward some excuse; so that men at length, in self-defence, are required to adjudicate on the excesses or deficiencies of either intelligence, as vice or insanity. The safety of society demands that a difference be maintained between crime and insanity, and the safety of the individual requires that the relation between any particular crime and his state of mind be established. Insanity may be stated to be a diseased condition in which the mental harmony is disturbed, and the intelligence as a whole is unable to appreciate the relations of an act. Crime, on the other hand, may be regarded as the evidence of, so far, an analogous condition, the mental co-operation is perverted though maintained, and the

capacity for appreciation remains. On what does the will of man depend? Is it not the ultimate decision which the moral and intellectual faculties conjointly determine? Lord Hale was not wholly wrong when he declared "all crime to be the result of a partial insanity;" for if the will be the product of mental operations, and those mental operations be opposed to the rule of right which the intelligence has acknowledged, that mind cannot be regarded as a sound mind which, thus imperfectly or improperly, arrives at a decision. We are brought to the question: Where does the ability to determine on a particular case cease or commence? for accordingly must be the responsibility or irresponsibility of the offender. Experience and observation prove that this mental guidance is, to a certain extent, under a man's own control; it follows that those illegal acts resulting from such a deficient or defective regulation of the mind as is within the individual direction of the will, are justly regarded as crimes; while similar acts, originating from mental conditions beyond the control of the will, cannot be esteemed as other than so many evidences of insanity. "No one," writes Dr. Duncan, "I presume, will dispute that every man who commits a crime or indulges in vicious habits acts as if he were mad—that is, he does not duly and correctly compare and weigh the consequences of his present actions, for if he did he would undoubtedly abandon them. The difference between the two cases is this: while the man in full possession of his faculties shuts his eyes to results that he does not choose to see, the poor lunatic, being blinded by his infirmity, is incapable of looking in that particular direction, and is, consequently, not acting against the impulses of his natural judgment." Consequent on the want of uniformity in the psychical and ethical perceptions of men, it follows that in many instances so much of crime as belongs to insanity is unnoticed, and so much of insanity as accompanies crime is undetected, until from some overt act an inquiry is instituted into their connection. The identification of crime with such a condition of mind as this is one proposition; the identification of crime with insanity, in its general acceptation, is altogether another; by confounding the two much injury to man and injustice to society must result, for the lunatic might be thus punished as the criminal and the criminal escape free.

The question comes to be discussed, What are those criteria by which may be determined the distinction between that condition of mind where man ceases to be a free agent and that in which responsibility is maintained? Knowing the difference of original mental constitution, circumstances, habits, education, and other modifying causes which conspire to produce a diversity of character and disposition in each, we are warranted in asserting that much of the doubt and difficulty in forming or receiving opinions has arisen from futile attempts to generalize on this particular point. Experience strengthens our belief that it is but presumption to propound a general rule. Winslow well writes: "No single fact nor any accumulation of facts, for each of which a possible, though inadequate, reason may be assigned, is *per se* conclusive of irrationality." Further observations more fully establish this truth and also indicate the danger of being guided by the opinion of those who, judging from the mere concurrence of events, because there may be a coincidence of phenomena which denote health, therefore presume that disease cannot be present. As we proceed in psychical analysis and become conscious of the moral and intellectual differences observable in men similarly circumstanced, exposed to the same temptations, and having equal means for the gratification of their wishes, the conclusion will force itself on the mind—despite of all that Locke and others have written to the contrary—that "there are certain intuitive principles appertaining to each individual, which, independent of education, give a natural bias, and sometimes a premature development to certain faculties." Therefore it is that an estimate of an individual character is the balance by which the value of symptoms presumed as indicative of unsoundness of mind in that individual must be determined.

The most limited observation cannot fail to supply many examples to which the ordinary criteria of sanity can scarcely be said to apply. Habits of deep thought and of abstruse research, in many minds, more fully develop personal peculiarities, which demark certain men from their fellows; such may, it is possible, transgress, or rather neglect, many of those conventionalities society requires, and revel in the luxury of their peculiarities. Their moral exculpation is, notwithstanding, generally conceded, while their individuality is

excused for the sake of that genius it envelops. When the moral intelligence becomes similarly involved, the offender is, however, placed in a far different position. Abstraction of mind must be distinguished from abandonment of principle; thoughts preoccupied be regarded as distinct from morals depraved; lest actions which are odd, but innocent, be confounded with conduct outrageous and evil. In pursuing a psychical study of the general and special relations of the individual presumed as being mentally affected, it becomes of vital importance to draw the diagnosis between an inability and an indifference for perceptions—an originally defective mental constitution, and that which succeeds to vicious indulgence—a deficient conception of moral responsibility and a wilful abandonment of moral rule. The experienced physician, if opportunity be afforded—and without this he should ever be silent—may generally succeed in truly estimating those peculiarities which distinguish eccentricity from insanity. The one must be regarded as the result of a sound judgment, unduly, indifferently, or perhaps erroneously exercised; the other arises from an inability of the judgment to act properly: the one offending against regulations established by custom—the other acting in opposition to those rules dictated by reason: the one, though in some instances not admitting of explanations wholly satisfactory, yet offering nothing in extenuation which is opposed to sense; the other capable of adducing no motive that does not involve an absurdity: the one acting according to a judgment based on principles resulting from his own rational, though, it may be, erroneous or perverted conceptions—the other acting according to fancies based on premises which admit of no recognition.

The elucidation of the question we are immediately discussing does not demand the same close analysis of the mental or moral intelligence in their mutual relation as an investigation into the subject of moral insanity entails; we rest satisfied with declaring that in the human mind two principles are recognizable, an intellectual and a moral, which, though capable of distinct exercises, are for the ordinary purposes of life intimate in their association and harmonious in their co-operation. For the fulfilment of positive duties it is evident that the direction of a discriminating judgment becomes es-

sential: the moral estimate of those duties being involved in the just appreciation of their relations. Regarding such a dependency as conceded, we proceed to the more practical exposition of monomania in its relations to crime.

Sir John Nicholl's opinion, in the case of Dew v. Clarke, makes insanity consist in the existence of delusion. Lord Erskine's views may be also quoted as propounding the same doctrine. Sir J. Nicholl has defined delusion as "a belief of facts which no rational person would have believed." Well may it be asked in the words of Sir J. P. Wilde, "What are the limits of a rational man's belief?" Lord Brougham has amended this definition, and stated delusion to be "a belief of things as realities which exist only in the imagination of the patient," pointing out that Sir John Nicholl gives a consequence of a condition as its definition. Delusion is again defined as "a pertinacious adherence to some delusive idea in opposition to plain evidence of its falsity." On this it may be observed, "Evidence of falsity is to be plain." Who is to say if it be so or not? Will all sane men agree whether evidence is plain or not? Again, the definition fails as including in its subject-matter a delusive idea in argument explanatory of itself. It is admitted that the fact of an opinion being altogether different from those ordinarily held, does not, therefore, constitute it a delusion. That which is quite clear to one mind may be wholly inexplicable to another. An opinion which is the result of deep reflection and sound inference may, to those incapable of estimating the premises or inductions, appear as the offspring of a deluded imagination or an overwrought fancy. The mere circumstance of an opinion being contrary to sound sense is no argument of unsoundness of mind in the person entertaining it, for an uneducated man may draw many inferences which are opposed to the simplest dictates of experience.

No one is surprised that an ignorant man should propound doctrines at variance with the admitted results of science; though we are ready to declare that similar doctrines, if advanced by another, might with truth be regarded as indicating his irrationality. We cannot regard the most decided change in the longest-cherished opinions as in itself indicating unsoundness of mind: since this change may result from that greater capability of forming a judgment which increased

experience or more matured reflection affords. "Though it may be an unsatisfactory reflection, it is yet a wise one, to consider our existing convictions as liable to error, like those which have preceded them." We are not at liberty to argue the irrationality of men who accord to sentiments which our better-regulated reason may abhor or our scriptural faith condemn, inasmuch as they may, for the entertaining of those sentiments, find such matter to form the basis of their faith as harmonizes with the unenlightened condition of their minds, though our intelligence altogether rejects the same as being opposed to every principle of right. In our estimate of the several delusions presented by the insane, we must therefore be ever careful to establish and maintain the distinction between erroneous conclusions from facts submitted to the intelligence and just conclusions from suppositions which originate in the intelligence. A man in the first position may entertain notions altogether at variance with those commonly received, and be at the same time, in the psychical and legal signification of the term, sane; while those in the second position may be influenced by the most dangerous sentiments, which, it is possible, escape detection until such time as some circumstance arises adequate to interrupt the ordinary latency of their course, and, as a consequence, to occasion their more prominent development. The mere diagnosis of monomania, irrespective of its association with crime, is surrounded by no ordinary difficulties.

How often has it occurred that death-bearing disease has silently progressed to such an extent as rendered its detection but the prelude to its close. The physical constitution possesses such a power of vital accommodation as enables it to tolerate any abnormal condition which does not, of necessity, interrupt its functional exercises. Post-mortem examinations have revealed important alterations of structure which, it may be, were never once suspected, or whose nature had at least never been determined. In psychical affections an analogy is fully sustained. That a man may be competent to conduct the ordinary affairs of life with credit to himself and advantage to others, that he may be adequate to fill high and important offices, and in the natural course of events leave this world without a question respecting his sanity or a blemish on his name, while during the greater part of his life

he was under the most absurd delusion, which was not detected simply because special circumstances did not lead to its prominent or unusual manifestation—is a fact which Dr. Duncan's experience and that of others has established.[12] In the instance mentioned, the evidence of the deranged intelligence rested on conceptions requiring for their exposition inducements altogether different from those met with in the ordinary affairs of life, and were therefore held, as it were, in abeyance, because circumstances calculated to develop the animus influencing the conduct did not prominently present themselves. This capacity for self-control or prolonged abeyance of the active influences of insanity has, in civil actions especially, led to much learned discussion as regards so-called "lucid intervals." In Waring v. Waring it is laid down: "By a lucid interval is not meant a concealment of delusions, but their total absence; their non-existence in all circumstances, a recovery from the disease and subsequent relapse." The marginal note puts the proposition even higher: "To constitute a lucid interval, the party must freely and voluntarily, and without any design at the time of pretending sanity and freedom from delusion, confess his delusion." It may be presumed that the "confession" is the test of the non-existence. On such an assumption this judicial ruling has, so far, been wisely permitted to rest in abeyance, since in the large majority of cases it would be found impracticable as a test, and when practical unreliable. Recent authority, it will be shown, has set aside this ruling, and has done so for reasons that are conclusive. In the year 1843 an inquisition was held before Mr. Commissioner Winslow upon a young gentleman of fortune and of mild manners, whose insane propensity was connected with windmills. When being removed by his friends to a place where there were no mills, in the hope that the strange propensity would wear away, the youth formed the resolution to commit murder, in order that his residence might be thereby changed, which act he accomplished on the body of a child whom he induced to accompany him into a wood. Lord Erskine,[13] in the course of his defence of Hadfield, observed that he remembered a man who indicted another for imprisoning him, and no act of the counsel (Erskine himself) could draw from him an indication of disordered mind; but when Dr. Sims appeared in court the man addressed him as

the Lord and Saviour of mankind. On account of this extravagance the person indicted by him was acquitted; but the man persevered, brought another indictment, and well remembering what had caused the former to fail, could not on this second occasion be brought to say a syllable indicative of his mental delusion. The existence of a delusion does not imply a capability of detecting it, while its most prominent manifestation may in no wise accord to the character of the crime it originates. Crime is naturally supposed to be the offspring of motives of one kind or another. When insanity is advanced as a plea in its extenuation, it must be by explanation of the act through reason of the motives, and the exculpation of the motives on the grounds of the delusive conceptions. Accordingly, many very eminent authorities have argued the necessity of establishing the relation between the delusion and the act, and made it the test of mental incapacity. In some cases a capability of doing so exists; if such were possible in all, much anxiety would be spared those involved in their adjudication. The instances detailed and others we shall enumerate prove that it is not in the nature of insanity as a disease that such uniformity should exist.

In defending Hadfield for shooting at the king, Lord Erskine argued that "to exempt from responsibility there must be a close connection between the delusion and the act." Were this acted on, how few lunatics tried for murder would escape, how many should fall victims to our incompetency to form just judgments! Hadfield apparently shot at the king with the view of being capitally punished for it. In the hope of insuring his condemnation at a time that he was perfectly conscious of right and wrong as regards the act, William Ross Touchett, brother to Lord Audley, fired at Thomas Smith with intent to kill, but was acquitted on the evidence of Dr. Monro. In both these cases there existed an insane desire for death, accompanied by the fear of committing suicide. Many similar examples might be adduced. Under such circumstances, to regard the acts of the insane as those of a healthy mind would be to enable the lunatic to accomplish his wildest determinations.

"Nullum magnum ingenium sine dementiâ" is an aphorism which is far more true than is generally supposed. The peculiarities and more than eccentricities of many famous men

prove them to have been under delusions of one kind or another; and the fact that they did not become criminal may be as much owing to the want of such an exciting cause as might so divert the current of their thought, as to any capability they possessed of successfully resisting incentives rather than inducements to crime. It is not by this assertion meant to insinuate that any necessary connection exists between genius and insanity. True genius is, if not based on sound sense, generally associated with it. The fact, however, remains incontrovertible, that many distinguished for the highest intellectual efforts have in their persons exemplified the slight barriers which separate exaltation of mind from alienation. If we inquire into the cause of this, special and general reasons present themselves; the first having reference to that undue receptivity and extraordinary excitability such minds too frequently exhibit—the second being assignable to the nature of the mental as well as physical occupations which usually appertain to such individuals. It is one thing when the intelligence can so command the imagination that ideal worlds rest within the control of the will. It is another and far different position when the imagination triumphs over the intelligence and acquires thereby the mastery of the will. In the one, the mind acts on the external world, and can withdraw from the contemplation of its ideal conceptions, or at least subdue them to the practical exercises of life. In the other, each motive to action results from impressions having no real foundation, and is, therefore, liable to vary with or according to, the character of such impressions. "Imagination," writes Sir Walter Scott, "renders many liable to be victims of occasional low spirits, when, but for the dictates of religion or the natural recoil of the mind from the idea of dissolution, they are willing to throw away life as a child does a broken toy." "People," observes Lord Byron, "analyze the supposed causes of maladies of the mind; and if the sufferer be rich, well born, well-looking, and clever in any way, they conclude he or she can have no cause for unhappiness; nay, assign the cleverness which is often the source of unhappiness as among the adventitious gifts that increase, or ought to increase, felicity, and pity not the unhappiness they cannot understand." "The irritability of genius," continues the same author, "is nothing more or less than a delicacy of organiza-

tion, which gives a susceptibility to impressions to which coarser minds are never subject, and cultivation and refinement but increase it, until the unhappy victim becomes a prey to mental hypochondriasis." "The master mind of Johnson in early life was overwhelmed with a horrible hypochondria, with perpetual irritation, fretfulness, and impatience, and with a dejection, gloom, and despair which made existence misery." The gift of a beautiful mind was, as Tuckerman remarks in the case of Cowper, marred by an unhappy temperament—"the chords of a tender heart proved too delicate for the winds of life, and the unfortunate youth became an intellectual hypochondriac." We might extend this list; and, particularizing the rashness of Chatterton, the failings of Collins, the aspirations and early death of White, the disappointments of Hayden, and the unhappiness of many others, inquire, "Is this the fault of themselves, or of nature in tempering them of too fine a clay, or of the world, 'the spurner of living and patron of dead merit?'" The purport of our present investigation does not call for such a scrutiny.

The instances quoted are sufficient to show that individuals of such a class open to us a new page in the psychical history of man, in which the pleasures and pains, joys and sorrows of life are strangely commingled, and for the appreciation of which ordinary criteria prove inadequate.

In the psychical estimate of such characters unusual difficulties must, therefore, always be expected. A certain license is both claimed and granted, for notwithstanding the apparent anomalies in their dispositions, much matter-of-fact ability and practical intelligence may also be manifest. Dr. Rush writes of a judge and of a divine, both confessedly insane, but whose discriminating judgment on the bench and whose refined eloquence in the pulpit were admirable. Baron Swedenborg, who was adequate to perform the duties of his office as minister to the king of Sweden, was so mad as to pull off his hat and make obeisance to Moses or Elijah in a crowded street, and fancied that the twelve apostles sat by him on twelve chairs in his apartment. A gentleman of high standing, under circumstances of unusual excitement, manifested unequivocal evidence of insanity, for which he was obliged to retire from the bar and to reside within a private lunatic asylum —proceeded on two different occasions from the asylum to

attend county assizes, where, in virtue of an office he held, he was intrusted by the crown with the conduct of most important prosecutions affecting life and liberty: which duty he sufficiently discharged, although his state of mind rendered it requisite that immediately after the termination of the assizes he should return to the asylum. We might particularize many other examples proving that delusions of the most extravagant character may occupy the mind, and yet the individual be fully competent for the dispassionate consideration of the most intricate questions, not involving the subject-matter of the delusion. Could we insure the non-extension of such a particular state of thought, we might, with perfect safety, allow those thus affected to be at large, to manage their properties, and take part in the ordinary affairs of life. But does experience tell us we can do so? Because many who labor under certain delusions do not commit crime, can we therefore declare that others who are influenced by similar delusions are responsible for their conduct? Can we take upon ourselves to determine the secret workings of the intelligence, and affirm that a particular act is the result of the deliberate judgment uninfluenced by considerations which we know to exist, and which we admit are adequate to materially affect, if not to wholly subvert, that judgment?

It has been laid down, "the only delusions which prove insanity are insane delusions." Sir J. P. Wilde asks, "But what is to be said of the more complicated cases? What if the diseased action of the mind does not exhibit itself on the surface, as it were, opposing its hallucination to the common sense or reason of all mankind, but can be tracked only in the recesses of abstract thought or religious speculation, regions in which the mental action of the same produces no common result and all is question and conflict? In what form of words could a 'delusion' be defined which would be a positive test of insanity in such cases as these?"[14] To affirm that insane delusions prove insanity is to be equally wise with Polonius—

> "To define true madness,
> What is it, but to be nothing else but mad!"

Lord Brougham's observations in his adjudication on the will of Sarah Gibson, the subject-matter in Waring v. Waring,[15] are explicit and deserving of careful study:

"If the being or essence which we term the mind is unsound on one subject, provided that unsoundness is at all times existing on that subject, it is only sound in appearance; for if the subject of the delusion be presented to it, the unsoundness of mind, as manifested by believing in the suggestions of fancy as if they were realities, would break out; consequently it is absurd to speak of this as a really sound mind —a mind sound when the subject of the delusion is not presented—as it would be to say that a person had not the gout because his attention being diverted from the pain by some other powerful sensation, he for the moment was unconscious of his visitation. It follows from hence that no confidence can be placed in the acts, or in any act, of a diseased mind, however apparently rational that act may appear to be or may in reality be."

This doctrine remained unchallenged for many years. On criminal trials it afforded counsel powerful arguments. In civil actions, especially in probate cases where delusion had existed, it was relied upon as proof of testamentary incapacity. In Smith v. Tebbett [16] Lord Penzance accepted and acted on its ruling. It was reserved for the judges in the case of Banks v. Goodfellow [17] to evince a higher knowledge of psychology, and, having carefully considered the two previous cases, to declare, "they were cases of general, not of partial insanity, and the doctrine therefore embraced in the judgment was wholly unnecessary to the particular decisions, and this being so, the question was not concluded by authority." Before proceeding to deliver judgment Lord Chief Justice Cockburn entered on a most valuable *résumé* of the opinions of eminent authorities on the question of delusion, and observed: "M. Troplong, in his well-known work, 'Le Droit Civil expliqué,' [18] and M. Sacase, in a treatise entitled 'La Folie considérée dans ses rapports avec la Capacité Civile,' [19] have adopted the doctrine of the unity and indivisibility of the mind, and the consequent unsoundness of the whole if insane delusions anywhere exist. Writers equally entitled to respect have maintained the contrary view. Le Grand du Saulle, in a very able work entitled 'La Folié devant les tribunaux,' [20] contends that 'hallucinations are not a sufficient obstacle to the power of making a will if they have exercised no influence on the conduct of the testator, have not altered his natural

affections, or prevented the fulfilment of his social and domestic duties; while, on the other hand, the will of a person affected by insane delusion ought not to be admitted if he has disinherited his family without cause, or looked on his relations as enemies, or accused them of seeking to poison him, or the like. In all such cases where the delusion exercises a fatal influence on the acts of the person affected, the condition of the testamentary power fails: the will of the party is no longer under the guidance of reason, it becomes the creature of the insane delusion.' M. Demolombe, in his great work, the 'Cours de Code Napoléon,'[21] M. Castlenau, in his treatise 'Sur l'Interdiction des Aliénés,' and Hoffbauer, in his remarkable work on 'Medical Jurisprudence' relating to insanity, have maintained the doctrine of monomania, or partial insanity, not affecting the testamentary disposition, does not take away the testamentary capacity. Mazzoni, in a recent work, entitled 'Istituzioni di diritto Civile Italiano,'[22] lays it down that 'Monomania is not an unsoundness of mind which absolutely and necessarily takes away testamentary capacity, as the monomaniac may have the perfect exercise of his faculties in respect of all subjects beyond the sphere of the partial derangement.'" Having cleared the ground by quoting these authorities, his lordship, in an elaborate judgment expressing the opinion of the full court, ruled: "Where the delusion must be taken neither to have had any influence on the provisions of the will nor to have been capable of having any, such delusion did not destroy the capability to make the will, and that a will under such circumstances should be upheld." Which judgment may be accepted as the present judicial mind on that question.

This is a practical acceptance of and dealing with facts and a common-sense view of this intricate question. If men move in and are of the world, mixing in its affairs in the mutual confidence of enterprise, any other doctrine would lead to endless complications, or estop many from the active business of life. Those who dissent from the views expressed in the judgment that assumes as adequate for the directing a will the same self-control as was manifested in other serious matters, have at least the assurance that for the real purposes of life, when the question arises and is discussed in the form therein expressed, substantial justice is done at least to

the written intentions of the deceased; intentions which during life he was permitted to act upon. The term "nor to have been capable of having any" must be interpreted to imply—as far as human judgment can infer from the actions of the deceased. Human judgment directs judicial decisions.

We have intimated our dissent from opinions which, irrespective of the existence of a delusion, identify responsibility with the knowledge of right and wrong as regards the act committed. In the case of Martin, tried for burning York Cathedral, it appears that he was fully conscious of the criminality of the act as regards its relation to the human law, but said "he had the command of God to do it." In those cases previously detailed the acts were known to be contrary to the law of both God and man, since it was such knowledge led to their commission, through the anticipation of the punishment which should ensue.

The physician who has had opportunities of studying monomaniacal disease must have remarked that many of the delusions entertained are sometimes slight perversions of a natural process of reasoning, and that in numerous instances "trifles light as air" lead to the commission of crime. Events which, under ordinary circumstances, would be regarded as of little consequence, if they harmonize, with the delusion, become a source of morbid excitement to the monomaniac, since his mind is predisposed to their reception. Opposed to this, real calamities which suddenly occur, more especially if they be not consonant with the pre-existing delusion, by withdrawing the mind from the ideal contemplation, have not infrequently been productive of the greatest benefit to the disease. The effect is far different when such are but superadded to previously existing and similar anxiety or care, for under such circumstances the powers of the mind may be broken down by the various overwhelming influences, and one of the predisposing causes of the insanity become the proximate cause of the crime. This was manifested on the trial of John Ovenston, at the Central Criminal Court, October 27th, 1847, indicted for feloniously shooting George Crawley with intent to kill. In this case it appeared that George Crawley, who survived the wound, had been instrumental in having the prisoner's goods sold under a judge's order, and that the prisoner in the afternoon of the same day attempted his assassination.

On the evidence of Dr. Conolly it was proved that the mind of the prisoner had been gradually losing its power, from the difficulties by which he felt himself surrounded, and that the crisis had arrived when he committed the act; and he (Dr. Conolly) "did not consider that his being at the time of trial, or soon after the transaction, in a state of perfect sanity, in any way affected the opinion he had formed, or was at all inconsistent with that view of the question." Here we have the predisposing cause of the insane state—pecuniary difficulties—identified with the person of an individual (Crawley), and this individual becoming the proximate cause of the crime. This is as instructive a case as is on record, for there was no prominent delusion, Crawley being the true occasion of the immediate distress. There was the existence of explicable motives on the part of the accused—revenge on the admitted cause of his distress; proof of premeditation in going armed to the office where the occurrence took place; evidence of self-control and discrimination which enabled the prisoner to withhold his violence until a fitting opportunity offered to effect it; the testimony of the medical attendant of the jail, Mr. M'Murdo, who "never observed anything to lead him to believe that he was of unsound mind;" while, added to this, the statements of other intelligent witnesses were adduced, who affirmed that on those matters respecting which they were competent to form a judgment, the prisoner seemed equally sane as themselves. Yet, with this accordance of facts and such corroborative testimony, one of the most experienced as well as distinguished psychologists of any age—Dr. Conolly—declared that "he did not go the length of saying that the prisoner was unconscious of what he did, but he believed that he was acting under such an impulse as he could not control, and that he could not distinguish the wickedness of the act, although he was conscious that he was committing it." This impulse must have been the result of a morbid conception identified with the person of Crawley, for otherwise, to use the words of Mr. Baron Rolfe in the case of Charles Burton, indicted for the wilful murder of his wife and child, "the excuse of an irresistible impulse, coexisting with the full possession of reason, would justify any crime whatever."[23] To this latter case, tried at Norfolk circuit before Mr. Baron Parke, July 20th, 1848, that of Ovenston was closely analogous, for in

both the attempt at crime and its commission were suggested by a fact, not a delusion; both in their previous symptoms showed equal grounds for presuming the presence of disease; both after the commission of the crime attempted suicide; while as regards the crime itself, there was this important difference, that on Ovenston's trial it was shown there were reasonable grounds for attributing the act to rational though vicious motives; while in Burton's case there was a perfect want of evidence to prove that any motives could have existed, since there was no known cause of disagreement between the man and his wife. The medical evidence in both was in favor of insanity, yet one was acquitted and the other found guilty and sentenced to death, though subsequently admitted to be insane.

Mr. Baron Alderson's opinion, when addressing the jury on the trial of Robert Pate, may be here quoted: "In the first place, they must clearly understand that it was not because a man was insane that he was unpunishable; and he must say that upon this point there was generally a very grievous delusion in the minds of medical men. The only insanity which excused a man for his acts was that species of delusion which conduced to and drove him to commit the act alleged against him. They ought to have proof of a formed disease of the mind—a disease existing before the act was committed, and which made the accused incapable of knowing at the time he did the act that it was a wrong act for him to do." This is in principle an anticipation of the ruling in Banks v. Goodfellow, as applied to the commission of crime. The former involved life—the latter property. The one required delusion to be identified with and influence an act in order to excuse the accused from its commission, the other, because the delusion was not associated with or influenced the bequest, upheld the testator in its execution. Such opinions are of the highest value as far as they extend, but beyond their reach arise complications and combinations which strain to the uttermost the disciplined judgment of the bench in their direction to juries, on whom devolves the duty of seeing that the public or individual safety is not lightly sacrificed, nor subtle theories too hastily adopted; since it is impossible with legal precision to define how far insane men are responsible; associate in all cases delusion with insane criminal acts;

diagnose in each instance the mind disordered previous to the consummation of the disease; identify the knowledge of right and wrong with the capability of voluntary action; or, in other words, lay down a rule which may fix to a standard the variable nature of disease, and reduce to a special scale the mysterious working of Providence.

The advocate-general, in the case of Henrietta Cornier and M. Dupin, on the trial of Darzac, has declared that monomania "is a chimera, a mere phantom, summoned as much for the purpose of snatching the guilty from the just severity of the law as of depriving a citizen arbitrarily of his liberty."[24] M. Collard de Martigny also asserts that "monomania is nothing but a passion which might be stifled in its birth." Let us inquire into the truth of these opinions.

Mill has observed there are two sources whence knowledge may be derived: the direct and the inferential. The first involves the immediate exercise of our senses; the second implies a capability of comparison, and, therefore, presupposes a criterion for judgment. In our diagnosis of psychical as of physical disease, it is essential that the information derivable from each of these sources be fully sought out, in order that, through their relations, their separate value may be estimated. The mere presence of a certain physical sign may, it is true, present the most unmistakable evidence of a special condition which is so plain and tangible that all recognize its nature. In psychical disease analogous phenomena can be with equal facility appreciated. How often, however, does it occur that the presence of a physical condition rests for its determination, not so much on its individual physical indications as on their relations to other general indications which are at the same time present. In psychical disease the analogy is fully maintained; owing, however, to its immaterial manifestation, a much closer investigation and a more intimate analysis are required; for not only must the essential nature of the indications be separately defined in their special and general relation to each other, but their accordance to the individual character be also determined, before an opinion be offered on their importance as characteristics of vice or disease; which, as Kollar well affirms, should be ever most carefully distinguished. The psychical as the physical constitution must be regarded as the ultimate expression of many

operations which, in their normal perfection, preserve a certain unity indicating health. When in physical disease this unity is interrupted, the patient is himself not only fully conscious of such a fact, but generally presents definite indications of the same. Defective or diseased functional exercises proclaim their operations in language which cannot be misunderstood. Men are conscious of this in their own persons, and consequently, while those indications characteristic of health are preserved in another, do not readily credit the existence of disease, however energetically its presence be affirmed. In psychical affections there are numerous additional reasons why this unwillingness to believe and inability to discriminate should invest the consideration of many cases with extreme difficulty. Effects, not causes, are the chief elements in our opinion. We infer the latter through the former, and estimate the former from their relation to a variable standard. The evidence of disease in one may be identical with the exercises of health in another. When, therefore, the plea of monomania is adduced as extenuation for crime, there is often nothing more difficult than to believe that acts which accord in their progress to the ordinary routine of natural events are the result of a morbid condition of thought, and we do not, consequently, wonder that many are to be found disposed to doubt the possibility of such being the case.

To deny the presence of such a disease as monomania entails the proof of its existence, which is invested with this difficulty—its evidences may rest on symptoms which, though perfectly explicable to the mind of the investigator, are altogether different in their relations to that mind of whose nature they are the chief indications. The error most usual to those who have not studied criminality in its psychical associations is this: Its evidences are estimated, not in reference to the mind of the individual accused, but to an admitted or presumed standard of mind. Ordinary observers draw their inferences according to the power or influence of their own motives as compared with their own position, rather than by their estimate of the motives which might actuate others in a far different position to commit the same act. We seek not by this to argue that the distinctions between vice and virtue require for their establishment fine-drawn subtleties or abstruse calculations; but we affirm that, because the practice

of either may co-exist with the perfect exercise of reason, such affords no just ground for inferring their identification with any particular mental state. Experience confirms this, since the monomaniac may be distinguished for moral excellence and the criminal be altogether free from the slightest taint of disease. How, then, is the fact of unsoundness of mind to be determined, if we admit that similar symptoms are met with in mental conditions so different? It by no means follows that because the same elements exist in separate bodies, those bodies are identical, or that in our estimate of vital actions a similarity of symptoms is confirmatory of a uniformity of disease. The value of symptoms rests on the order of their appearance, progress, and combination. In psychical affections this is abundantly manifest, and in none more so than in that of monomania whose existence has been thus questioned.

Monomania might be well considered as a disease in which the mind appears to suffer from "a paralysis of its powers of conception," and is inadequate to appreciate the general or special relations which the subject-matter of the monomaniacal conceptions involves. In the most healthy mind there is nothing more difficult than to unlearn—that is, to divest the mind of preconceived notions, in its abstract consideration of any matter involving the simple logical relations of these notions: and why? To do so requires an original and vigorous effort of thought, and the independent operation of an intelligence already preoccupied, which, on the particular matter to be investigated, is in the most imminent danger of being abnormally or deficiently exercised. The mind in which a monomaniacal predisposition has been established has each of its natural tendencies exaggerated, and therefore it is that, with a process of reasoning insanity, a patient so affected is at times not only singularly pertinacious in the defence of his absurdities, but is also enabled, as in the case quoted by Lord Erskine, to baffle such inquiries as might be instituted into his mental condition.

There is, to diminish the difficulty in diagnosis, a remarkable and close analogy between the progress of crime and that of monomania. This assertion may appear paradoxical, since the analogy might be presumed to have a contrary effect: why it is so will be apparent.

Most criminal acts may be regarded as the ultimate oper-

ation of vicious habits, in which the infringement of the civil law is superadded to the habitual disregard of each ethical relation. Under these circumstances the nature of the act to be considered manifests such conformity to the previous character, that no one questions the operations of justice or hesitates to believe in the full criminality of the offender. The mental process by which a delusion becomes established, and the stages of vice preceding the perpetration of crime, are equally progressive. The first crime, like the first monomaniacal supposition, the moral as well as mental intelligence may repudiate; fresh inducements to crime occur; the moral sense may yield to the temptation, yet be conscious of the fault, in the same manner as the mind of the monomaniac recurs to the supposition it *in initio* admits to be unsustainable. Temptation successfully resisted loses its power—temptation when yielded to increases in strength. Thus step by step and stage by stage a certain condition becomes established, be it monomania or crime. In the commencement of the first, it is quite possible that whatever the nature of the monomaniacal tendency be, its relations are estimated according to the dictates of sound reason, and the delusive conception dismissed as soon as formed. A period of mental freedom elapses; thoughts of the same character recur; circumstances may conspire to confirm them; with every confirmation the opinion they tend to is strengthened, and with the strengthening of the opinion the intelligence is rendered, so far, less disposed to question its accuracy. In the progress of crime a similar progressive movement is observable, "*nemo repente fuit turpissimus*" being most true. It is by acquiescence in vicious practices aptitude for crime becomes established, when the moral intelligence, failing to enforce its dictates, ceases to respond to the perception of right.

A certain similarity in the nature of the progress of this form of metal disease and vice is thus maintained. As crime entails a breach of some regulation appreciable by the general perception of man, and usually affecting their immediate interests, its discovery is seldom a matter of difficulty; but inasmuch as the evidences of monomania not infrequently accord to the natural mental exercises, its diagnosis, it is possible, may be most obscure. Juries are therefore fully justified, while the law allows them the privilege of pronouncing judg-

ment respecting such matters, to hesitate in delivering an opinion; since in examining their own hearts they may find much to correspond with motives or conduct of whose nature they are, under the most solemn obligation, called upon to determine. "How few," as Dr. Conolly so truly remarks, "can sincerely say that in themselves no foibles or imperfections, no passions or heedless impulse, no sins, presumptuous or conceded, exist; which, in certain circumstances, might not have led to sorrow, or never-ending regret or despair. to crime or to shame." [25]

Were mankind originally endowed with similar mental or moral constitutions, it would, notwithstanding such a conformation, be but reasonable to expect that the variety of agents acting on that constitution would produce an equal difference in their results; and that, therefore, as individuals progressed to maturity, the multiplicity of pursuits which occupy and the diversity of interests which influence each would so develop different mental or moral faculties that this original identity should thereby be lost. It appears, however, from our observation of life, that this mental difference observable among us is not the mere work of accident, but pre-ordained for the greater perfection of the great whole, of which we each constitute but so many items. Did men all think and act alike—did the same tastes uniformly prevail, it would be easy to imagine what our social condition would be, with requirements little more than instinctive, and pursuits as a consequence scarcely in advance of the animal. Deeply implanted in each breast is the onward impetus. To it all that is great in science or useful in art is due. Men's interests are reciprocal and their dependency is mutual; because, however their dispositions or habits vary, their ultimate object—individual enjoyment while here—is the same; their ultimate end—future happiness hereafter—identical.

As each one has his pleasures, which, however they be reciprocated, none can so truly realize as himself, so each one has his sorrows that are known but to himself. "The trials of life are like countries—every one has his own, and to attempt to reduce them to one common type would be to set aside the peculiar sensibility proper to each." [26] Admitting this diversity, it must still be remembered that there are certain ties, feelings, and affections common to all, the mainte-

nance of whose harmony involves the social happiness of each. Divine law ordains that our natural emotions be held in regulation; human justice demands that their injurious exercise be punished, unless it be proved that the individual was, at the time, irresponsible. This is, we contend, the great question for the physician, the more so when we reflect how much of misery and how much of crime do men voluntarily create for themselves. Many are to be met with who willingly abandon themselves to particular habits, and live in disregard of ordinary rules. Society may be indifferent to the sentiments of the one and tolerate the peculiarities of the other. Each one claims his right of private judgment and independent action, and it is conceded to each; but for mutual regulation a certain conformity of the will to the law is required, since a spirit of duty and power is thereby secured; for were men permitted to conform the laws to their will, with the difference of the will there would be a difference of the law, and an end to anything like uniformity on earth. Peculiarity of opinion is one thing; peculiarity of conduct is another. The law seeks not to recognize any peculiarity of opinion as being identified with irresponsibility, until this peculiarity, of whatsoever nature it be, becomes associated with such conduct as proves the individual to be so completely under the influence of that opinion that his actions are incapable of being regulated by other motives than those which that opinion may supply, in consequence of which his own well-being or that of society is at stake and in danger.

We have impressed the necessity of fully analyzing the individual character and inquiring into the previous history before attempting a diagnosis in mental disease. Circumstances will occur in which the fullest knowledge of both affords little guidance in the formation of opinions, beyond the negative proofs they may offer of a special disposition. Many men are found to be laboring under a delusion, whose previous conduct has not demonstrated the process by which that delusion has been established. Many individuals are undoubtedly guilty of the most flagrant crimes, whose previous life was strangely at variance with the execution of the particular act. Knowing the passions, the desires, the motives, which influence the minds of men; the deceptions practised by those who assume virtues which they do not possess—we are

led to the conclusion that, though every moral observance is an important reality, yet the absence of crime is no guarantee for the presence of virtue; nay, more, that the exercise or practice of mere moral observances cannot be received as conclusive evidence of the existence of a high moral sense. Men may cherish feelings of malignity against some one of their fellows, which, in accordance to the opinions of others, they endeavor to subdue. Criminal desires may influence the conduct, which is manifest in the exercise of practical benevolence with tho

> "Who thus do clothe their naked villainy
> With old odd ends, stolen forth of holy writ,
> And seem as saints when most they play the devil."

In men of this class hypocrisy envelops rascality until such a time as fitting circumstances unfold their true character. These circumstances may not arise until the opportunity occurs for the perpetration of a particular act, and then, when society demands the investigation of that act, a confident appeal is made to the previous career to prove, not the non-existence, but the concealment, of criminal desires. It is true that in such an instance the commission of crime may argue that the passions so far overcame the judgment as to render it incapable of estimating the relations or calculating the consequences which might result from the perpetration of the act, of whatsoever nature it be, and the excitement of the moment create "*furor brevis*," and so, to a certain degree, extenuate its commission. This is the most that justice can concede, for did such excitement excuse the crime, the majority of capital offenders would be acquitted. The actions rather than motives must constitute the test of criminality. The individual application of this test rests on the opinion of the jury on the one hand, and the diagnosis of the physician on the other, who in such an instance are called on to discriminate between crime and disease, and to say how far one may have been influenced by the other.

In seeking to establish the relations between monomania and crime, it would be a grievous error to suppose that all monomaniacs must be criminal. The indulgence of particular whims may be indicative of folly of the most extreme degree, which does not become crime until such time as, for the ulti-

mate gratification of a peculiar fancy, of whatsoever nature it be, the axioms of morality and of law are wilfully violated. Letting it be remembered that morality and law are not identical, instances are on record in which, for the possession of matters not within their reach, thefts have been perpetrated by individuals in whom insatiable desires of one kind or another existed. The illegality as well as abstract immorality of the peculation may be fully admitted, but the capability of resisting temptation be wanting, even though in all other respects the strictest observance of propriety and the nicest sense of honor be maintained. Monomania may in such individuals lead to actions which their intellectual and moral animus condemns, and a difficult question arise as to how far such individuals are responsible; for though the intelligence may be weak, it does not follow that it must be wicked. It is in the fact of moral deficiency coincident with intellectual sanity that criminality rests. This mental inability to direct the moral intelligence originates a proposition as to how far both, in such an instance, or in similar instances, may or must be associated.

The subject of monomania is one so extensive and important that to enter minutely into a detail of the peculiarity of its manifestations, the complexity of its symptoms, and the variety of its terminations, would necessitate a comprehensive analysis of mental operations, and a close investigation of the correlation of the psychical and physical constitution, as evidenced in an almost endless variety of cases. It would be vain to hope to do more here than state those principles which should guide in instituting so serious an inquiry.

A criminal act is attributable to a monomaniacal condition. The cases which may have eventuated in this condition come to be investigated, and are found capable of being ranged under the following heads:

I. Causes apparently appreciable by ordinary observers: the insane act corresponding to the usual operations of crime.

II. Causes explicable solely by the psychopathic condition of the individual: the inducement to the insane act originating in the deranged intelligence.

III. Causes identified with the personality: the insane act being associated with morbid physical conditions.

Of cases illustrative of the first class of causes we might

adduce many examples similar to that of John Ovenston. Differing from moral insanity in many important particulars, though coinciding with it as regards the moral abandonment manifested in the act: distinguished from impulsive insanity in the predetermined direction of the act. The diagnosis in cases of this nature rests on the individual application of psychical principles—the relation of motives to the mental condition at the period of the perpetration of the act, rather than the accordance of motives to the character of the act. It is quite possible that motives actuating the insane may correspond to the ordinary operations resulting from a healthy though vicious mind. In such a case the predisposing and exciting causes are closely analogous to those adequate for the production of crime, and require for their just appreciation the nicest application of medical principles, which determine the value of a special symptom, not as an isolated phenomenon, but as the appreciable result of progressive, though possibly latent operations; to be estimated in its relation to the morbid condition it indicates, as well as to the sum of those general symptoms of which, perhaps, it constitutes the most important item.

In cases of this nature, as well as in the generality of instances, the period at which a physician is called on to give an opinion from personal investigation is a matter of importance to be considered. It may be that, immediately subsequent to the perpetration of a criminal act, the mental condition from which it had proceeded undergoes such a complete change that the responsibility of the offender becomes a question respecting which ordinary observers, forming their judgments from individual inspection, could entertain little doubt. On this point we have already quoted the opinion of Dr. Conolly, as expressed on Ovenston's trial. In this respect, the analogy existing between affections of the nervous structures and those which we term mental diseases is strikingly illustrated. In many instances where the nervous system is involved, it is observable that the constitutional disturbance, local symptoms, and special phenomena which precede and indicate some great climax, such as a convulsion or epileptic fit, after these have passed, completely and altogether subside until reaction be fully established, and the causes adequate for their reproduction again come into operation. In

like manner, where unsoundness of mind exists, the commission of a startling crime has been followed by a complete, though it be but temporary, cessation of all mental disturbance, and such a state of quietude has ensued that it becomes a matter of difficulty for the inexperienced to credit the assertion that insanity had preceded and produced the events which constitute its chief evidence. Many examples of this important psychical fact will be afforded when the subject of insane impulse comes under consideration.

To the second class of causes by far the greater majority of cases of monomania may be referred. Esquirol has calculated the combination of hallucination with monomania at about 80 per cent. The process by which such a mental condition is accomplished finds in the progress of vice its analogy. At first a caprice, then a doubt, followed by a period of repose; a return of doubts, which from favoring circumstances become transformed to convictions, the more decided as they are the less probable. Intervals of rationality alternate with periods of delusion. As the disease advances, those intervals become shorter in duration and less frequent in occurrence, until at length the thoughts are so thoroughly occupied as to be rendered incapable of divesting themselves of the conception by which they are morbidly subjugated, and to which they are, therefore, irresistibly attracted. It is possible this essentially deranged mental process in one may so closely accord to the operations of health in another that until some circumstance leads to its consummation, its true nature is not appreciated; or it may silently progress and eventuate in criminal acts so inexplicable as to demand a close psychical investigation of motives which might possibly have induced their commission. The nature of the delusion may be as varied as there are different objects and different subjects to act or be acted upon, being equally dependent on the individual character and position as on those general circumstances from which it originates. The monomaniac, under the influence of his delusive conception, may fancy that his relation to all around is changed, and, actuated by such a delusion, perpetrate extreme acts. Or, while preserving his own identity, imagine that others are changed in their relation toward him; and, considering himself the object of special persecution, resolve on some act which he conceives is calculated to insure

his personal safety. Though in the former instance there be a facility of detecting the special condition, it not infrequently occurs, consequent on the abnormal reasoning process which becomes established in a mind so affected, that its recognition is involved in much obscurity. In the latter it is quite possible that the criminal act is the first indication of the monomaniacal condition. In such a case the differential diagnosis as to the character of the insanity rests between premeditation—the offspring of delusion, and impulse—the result of a more general insanity. In contrasting the insane with its analogous criminal act, though we may have the former according to the deliberate determination of a depraved and wicked mind, it will, notwithstanding, be found to result from mistaken though apparently rational conceptions, adequate to subvert the healthy exercise of the judgment. Under such circumstances an inquiry may arise as to how far the apparent conjunction, rather than identification of crime and insanity, might warrant a modification of treatment, in which the rigid discipline of reproof and the curative resources of medicine should be conjointly exercised.

It is to this class of causes that the influence exercised by religion may be referred. The writings of Dr. Cheyne and others have fully shown the error of those opinions which would attribute to religion a capability of originating derangement of the mind. It has been satisfactorily proved that religion, *per se*, is not only wholly inadequate to such an end, but it is the surest preservative of that mental peace and proper regulation essential for happiness and identified with wisdom. "True religion, though by no means a complete preservative against mental derangement, affords the surest guarantee for sanity," since by it, those trials of life from which none are exempt are deprived of much of their bitterness, and the excitements of ambition, by which many are misled, are effectually subdued. Schiller could, therefore, say with truth that "Virtue was that form of mind most conducive to health, because it excites the most durable of all joys." It brings no sorrow in its train, and manifests no melancholy in its action. Opposed to this are those fanatic doctrines which sectarians promulgate, that excite, and, at the same time, agitate the mind; that preach ascetic truths and terrify the awakened sense. "We firmly belive," writes Dr.

Cheyne, "that the Gospel, received simply, never since it was first preached produced a single case of insanity." In this, all who have felt or received scriptural doctrine will acquiesce. When, therefore, we read the histories of many who suffered in a similar manner to those melancholy anchorites whom Prosper Alpinus described as having witnessed in Egypt, "who looked black and filthy, and were dried and withered like mummies;" and hear of others who in profound grief for past sins, real or imaginary, sorrowed as those without hope; or, on the other hand, in joyous ecstasy imagined they were subjects of special sanctification and divine grace; though we are prepared to admit that both fanaticism and superstition may have caused similar instances of insanity, or, it may be, thus determined the form of the disease, we are not therefore warranted in considering such phenomena as the result of religion, but in the same manner as derangement of the mental faculties may succeed to misapprehension of, and ill-founded terror arise consequent on, a false conception respecting human law, so the erroneous estimate of divine truth may lend a particular feature to the operations of a mind previously wavering in its ideas.

It is thus that there are many of what are termed "religious monomaniacs" to be met with; who, like those unhappy fanatics, Arthington, Coppinger, and Hacket, executed in the days of Queen Elizabeth, may fancy themselves specially directed by heaven to accomplish particular acts; or who, like Martin, of later years, may think that in violating all human enactments they are thereby doing God service. When we recollect the solemnity and magnitude of the interests involved in religious considerations, and the important position such must occupy in all sane minds, we cease to be surprised that the mind, from any cause becoming deranged, while the thoughts are unsettled, and the imagination wandering without a fixed object, finding so fruitful a source for its extravagant exercises, and one so thoroughly adequate to supply food for reflection, should adopt some delusion identified with, or arising from, the magnitude of those interests therein revealed. Phenomena are thus superadded to a disease which exists: they are its consequences, not its cause. Religion, under such circumstances, does not overcome reason, but is perverted by it. The monomaniac fancies that he receives

such a message as either communicates the will of God to him, or discovers certain truths which to others are unknown. His disturbed reason establishes a necessary connection between the matter of presumed revelation and a necessity for some particular act, the fulfilment of which proclaims his condition.

Again, the observations of Lord Penzance best sum up what we have endeavored to express: "It is not, assuredly, in the region of enthusiasm that we must look for the calm exercise of pure reason, temperate and well-balanced ideas, or exactness of logical thought. Still less must we expect that the fervor of fanaticism will follow in the slow steps of philosophy, reaching its conclusion by the graduated steps of proof."

"It is hardly, then, by the mere test of their reasonableness that the wild thoughts of religious enthusiasts can be brought to a standard for judgment of their sanity."

"But there are surely limits, even to so mythical a subject within which the human mind in a state of health is unreasonable or extravagant; and the common experience of life gives us a sense of those limits sufficient for the formation of judgment in most cases. To draw the exact line, if there be one, which defines such limits may be impossible; but to affirm that some instances surpass it, is not so. 'No one,' said Burke, 'can say when twilight begins or ends, but there is ample distinction between day and night.'"[27]

The third class of causes necessitates many psycho-physical investigations which physicians are alone adequate to institute. Those who have witnessed the progress of hypochondriacal insanity will at once affirmatively respond to a distinguished author's inquiry, who, when speaking of the psychical estimate of the actions of men, "the records of whose lives form the dark scenes of history, and present to the world a continuous career of morbid selfishness, crime, cupidity, caprice, tyranny, brutality, and vice," asks: "May not all these monstrous departures from ordinary and healthy modes of thought, impulse, and action, constitute evidence not only of depravity and vice in their ordinary signification, but of undetected, unperceived, unrecognized mental disease, in all probability arising from cerebral irritation, or physical ill health?"[28] In the case of Arnold, indicted at Kingston-upon-Thames, before Mr. Justice Tracey, in the year 1724, for felony

in wilfully shooting at and wounding Lord Onslow, "it was shown that he had not only been long subjected to aural and visual illusions, but he was habitually under a variety of delusions; imagining, among other extravagances, that Lord Onslow was in his bosom, constantly persecuting him, and preventing him from eating, drinking, sleeping, or being at rest."[29] It is true that under circumstances of this nature little doubt might arise respecting the character of the act resulting from an intelligence so decidedly deranged. Other instances, however, will be met with, wherein the close association of the morbid condition and the insane act are by no means so apparent, although the dependence of the one on the other as certainly exists.

In the case of Luigi Buranelli, executed for the murder of Joseph Latham, the importance of duly estimating the relation which physical lesions bear to psychical operations was forcibly illustrated. On his trial, among other evidence adduced in proof of his unsoundness of mind, it was shown that he had manifested unmistakable delusions, not only respecting his physical state, but that these delusions, passing beyond his personality, assumed such a character, and were associated with such other psychical manifestations as, under ordinary circumstances, could leave no doubt respecting the mental condition of which they were the indications.

The details of this, a most important medico-legal trial, are elsewhere fully given, and the medical evidence philosophically discussed.[30] Its perusal cannot fail to impress psychologists with the necessity of appreciating combinations of disease, an analysis of which constitutes the highest exercise of the medical mind.

Two questions arise:

1. In what does hypochondriasis as a disease consist?

2. How is it to be distinguished from insanity?

The answer to the first involves the second of these propositions.

The mere fact of a disease receiving a special name implies its exhibition of some feature sufficiently constant to lead to its recognition. This feature must rest either in some determined pathological condition or essential vital phenomenon. The first argues a certain identity in physical causation; the second an equal uniformity in constitutional reaction. That

in the generality of diseases such are found to prevail within cognizable limits, is a fact which enables observation to constitute experience. When we find medical men who have had great opportunities of obtaining knowledge differing, as in the case quoted, so widely in their views, we are naturally led to inquire wherein the source of error consists. The inferences at once suggest themselves that either the data for the formation of their opinions were undetermined or that the principle which should guide their appreciation admitted of error in its application. Observation assures us that it is to the latter this difference is chiefly, if not wholly, due.

For the determination of the true nature of hypochondriasis, we must assume many facts as admitted, whose proof, though by no means difficult, would still lead to extraneous dissertation. As a psychopathic problem, hypochondriasis, for its solution, requires a full recognition of the several actions and reactions which occur between the different nervous foci and the organs to which they minister, as well as of the reciprocal influence mind and matter mutually exercise. The first affords the nearest explanation of the various anomalous neural sympathies and visceral derangements possible by and through a known lesion. The second explains how, in the absence of any special attracting cause, long-continued mental depression eventuates in general physical derangement, manifest through the impaired action of viscera proportionately to their nervous supply; or how it is that disease affecting the viscera reacts on the general nervous system, and so disturbs that harmony essential for health. Causes primarily affecting the system and acting through it on the mind—causes originating in the mind and reflected from it on the system—prove adequate to alike interrupt those psycho-physical relations essential for health. These causes are as numerous and as various as the individuals affected. We are warranted in asserting that an impartial scrutiny of the material, as well as vital pathology of hypochondriasis, fails to identify it with any fixed physical accompaniment, or any necessary symptom in relation to such accompaniment. This is to a certain extent confirmed by the various theories which different observers have advanced respecting its pathological nature; the chief error of whose doctrines consists in their having mistaken frequent for essential phenomena, and so con-

founded incidental symptoms, and the sources to which they were due, with the disease from which they had primarily proceeded. Pending inability to offer any definite explanation of the steps by which the condition termed hypochondriasis is accomplished, further than may be derived from the observation of its perfected phenomena; seeking how far the fact of variable causes producing uniformity in their result is explicable, we are led beyond the material structures to investigate the psychical nature of those feelings or emotions which become interrupted, and to seek there for some principle or feature, which, being common to all, may therefore constitute a point for subsequent research that will be available in each. This we possess in the simple recognition of those innate sentiments ordained by nature among her first laws—those desires for self-preservation which attach all equally to life. "Men," observes Bacon, "fear death, as children fear going into the dark." This feeling must be regarded as proceeding not so much from their love of life, nor apprehension of the future, as from that something in the abstract consideration of death which the best-regulated mind must acknowledge as being powerful through its very mystery, and capable of exercising on the greater majority of individuals an influence that they themselves may be scarcely conscious of. Until this principle be morbidly aroused, and the psychical sympathies associated with it called into action, the individual cannot be considered as hypochondriacal. However we may admit that a disarrangement of nervous functions, associated with, if not dependent on, a variety of organic lesions, forms the basis of hypochondriasis, it is not the organic change constitutes the disease, since its first, most important characteristic, and only constant symptoms, are those psychically evidenced through a morbid exaggeration of this natural principle; which, attracting the thoughts to the personality, constitutes it the centre around which the individual's hopes, fears, and wishes revolve—the special character of those thoughts being evidenced according to the particular nature of the organic lesion to which they are attracted. Hypochondriasis may be regarded as presenting two principal stages: that in which it exhibits the characters of a neurosis; that in which it has merged into a psychosis. The steps by which their union or transition is accomplished are so gradual that they are often

difficult to determine. Considered as a neurosis, the inquiry arises as to how far its general and complex symptoms are dependent on the interminable union between the several nervous centres. Investigated as a psychosis, we seek if the suppositions entertained respecting the corporeal condition are explicable by possible, however improbable, deviations from an admitted standard of physical health. It is in its latter character alone that hypochondriasis is constituted a psychopathic question.

In its earlier stages, the morbidly excited attention being attracted to the personality, physical lesions become invested with special significance, when "disturbances of the animal sensibility, impressions which arise from without, and external sensations, give rise to numberless illusions." Reason and reflection prove adequate to guide the judgment for their correction. Local changes originate abnormal sensations; alterations in the nervous apparatus render it not only an unfaithful, but a pernicious messenger; yet so long as the judgment continues unimpaired, the sensations, however they may be misinterpreted, are not, as Esquirol has remarked, attributed to causes "repugnant to reason." As the disease advances, and the psycho-physical reactions become more thoroughly established, the capacity of appreciating the deceptive character of the sensations experienced, or the groundlessness of the suspicions entertained, become gradually lost, when from the clearest consciousness of their illusions, hypochondriacs pass through intervals of doubt to conviction, and a mental condition results which, in the fullest acceptation of the term, must be regarded as insanity. The mere fact of a disease being present affords no stronger argument for the mental responsibility of the individual, who, in consequence of its existence, entertains absurd, irrational, and morbidly-exaggerated conceptions respecting his physical condition, than does the existence of apparent grounds, or explicable motives for crime —as in Ovenston's case—argue the mental soundness or unsoundness of the individual perpetrating it. Winslow has well drawn the distinction between "mere errors or deceptions of sense," and such impressions as the morbidly-affected mind receives through the locally-impaired nervation. The confounding of the one with the other cannot fail, as in Buranelli's case, to open a wide path for discussion. In the former a con-

sciousness of the erroneous impressions exists. In the latter the impression, of whatever nature it may be, serves as a pretext for the most extravagant mental exercises.

Admitting that a real cause for abnormal sensations exists, its presence cannot be regarded as any argument for the mental capacity of the hypochondriac so long as these sensations, being opposed to reason, are accredited in direct opposition to the evidence of the other senses; neither can the patient be considered as simply hypochondriacal, when, passing beyond the personality, those erroneous impressions influence his general conduct. There may be, for the purposes of prognosis and treatment, a wide difference in the affirmation that because a man is hypochondriacal he is insane, or that he is hypochondriacal because he is insane. Justice, however, requires that, for the determination of mental responsibility, neither the known preceding, nor the probable succeeding, mental phenomena should guide our opinion, but our examination of the mental condition at the period of the commission of the act under consideration. The transition of hypochondriasis into insanity is from many causes involved in obscurity; when, however, such is proved to have occurred, in the greater is merged the responsibility of the lesser disease. Allowing, for the sake of illustration, that the unmistakable change in Buranelli's character which became evident subsequent to a severe mental shock; that his acute mental depression and marked disposition to suicide; that his delusions respecting his physical condition, and the physician who attended him, and his association, to a certain extent, of his subsequent victim with these delusions; that the character of his correspondence and general conduct before the perpetration of the act for which he was tried; that the nature of the crime and his attempt at self-destruction—instead of, as has been ably shown, indicating suicidal melancholia and positive insanity which circumstances urged to their climax—were, as the physician examined on the part of the prosecution affirmed, explicable on the assumption of hypochondriasis, should we, notwithstanding, be warranted in the assertion that an individual so affected was also, in the fullest acceptation of the term, insane? In Buranelli's case we believe that such hypochondriacal symptoms—if hypochondriacal—as were present, must be regarded as the consequences, not the source, of the mental

condition of which they were in a measure indications, his case being but a further confirmation of the psychical truth that the existence of a positive delusion, by whatever means it be produced, should be regarded as evidence of unsoundness of mind, and the individual responsibility be determined accordingly.

The consideration of monomania as a plea in extenuation for criminal acts must, from the complex nature of the questions it involves, be invested with varied and great difficulties. The necessity of carefully and fully investigating each particular instance, of making every inquiry a separate problem, to be decided on its own merits, will, as cases are presented, be the more obvious. By doing so we can alone hope to arrive at truth, since we believe it will be found that experience and observation attest—

I. That the law has failed to lay down such a definition as might indicate each example of monomaniacal insanity.

II. That the existence of monomania does not depend on the presence or absence of any particular symptom or group of symptoms.

III. That though the essential nature of the disease implies the existence of a delusion, the symptoms are not in all cases adequate to establish the nature of the delusion, or its association with a particular act.

IV. That though a recognized delusion may lead to the perpetration of a criminal act, the nature of the criminal act does not of necessity accord with the character of the delusion.

V. That the monomaniacal condition involving the delusion may have its origin in circumstances which, to the healthy mind, apparently admit of the most rational explanations.

VI. That the perpetration of a criminal act may be the first prominent evidence of such a monomaniacal condition.

VII. That the knowledge of the illegality of a particular act cannot be considered as evidence of a criminal disposition in the commission of that act.

VIII. That though the civil relations of a particular act be fully appreciated, its ethical relations in the mind of the monomaniac may to him invest its commission with the highest moral excellence.

IX. That though the civil and ethical relations of a par-

ticular act be fully appreciated, its commission cannot therefore be considered as irreconcilable with unsoundness of mind.

X. That the co-existence of this knowledge respecting the nature of the act may to the monomaniac be the chief motive for its commission.

XI. That though the question of the legality, wisdom, or criminality of a particular act be open to the discussion of all, its psychical relations to the personality are essentially the province of the physician.

XII. That the question of criminal responsibility is one involving the existence of mental freedom, which demands an intimate knowledge of the psychical and physical constitution in their relations in the individual.

XIII. That this knowledge implies an investigation of the previous history and circumstances, and a due estimate of those various modifying causes, which, directly or remotely, may affect the inquiry at issue.

CHAPTER III.

MORAL INSANITY.

In proceeding to the consideration of those insane states in which the exaggeration or perversion of the moral intelligence, or affective faculty, is that most evident, the intellectual powers being apparently unaffected, so constituting the "moral mania" of writers, we enter on as important an investigation as the intricate study of psychopathy affords. In the ordinary physical operations which are daily witnessed, similar combinations, when apart from vital influences, are found to eventuate in like results; experience imparts a capability not only for their accurate appreciation, but also for their predication, which capability is proportionate to the degree of certainty attainable in each demonstrative science. Medicine, while offering to the reflective mind the highest range of study such investigations embrace, at the same time opens a much wider field for induction; since, while duly estimating the importance of material relations, the reciprocity of action evinced by the several organs, and the varied physical changes explicable by organic laws, the mysterious influences associated with vitality must also be recognized; when the apparently diverse operations of a single law, or the concurrent operation of different laws, according to the circumstances which modify its development, or regulate their combination, come to be appreciated in their general as well as particular relations. The investigator of disease who carefully studies its progress soon learns to divest his mind of fixed rules, since instances not infrequently occur in which the most searching analysis fails to explain the rationale of vital operations, though observation at the same time satisfies us that there exists a certain uniformity in their conjunction. The truths of medical experience are not the less valuable because in many instances they are inexplicable. As our in-

timacy with morbid action extends, scepticism diminishes: continued observation leads to the organization of knowledge; vital phenomena, as particular facts, are thereby referred to others more general, whose scrutiny, it is not impossible, may eventuate in the recognition of some principle in nature of which no explanation can be given, yet from whose estimation rules of great practical utility are derivable.

It is especially important that those who desire to justly estimate the varied characteristics of the disease about to be considered, be duly impressed with the true nature of the connection which exists between the moral and intellectual faculties. Such knowledge, while entailing an analysis of the mental constitution as appertaining to all, at the same time involves the careful study of those various circumstances capable of influencing its development in each.

The study of mental health, as identified with mental soundness, should form the basis of every inquiry in which the question of sanity is to be determined: without such knowledge treatment must be empirical, and opinions undirected by general principles prove valueless. This study, it has been by many supposed, demands a capability for abstruse speculations and metaphysical research, and is, therefore, invested with extraordinary difficulty. It will, on reflection, be apparent that the useful exercise of medical science is altogether remote from doctrinal subtlety, resting on evidences which, however in their ultimate analysis impenetrable to philosophic scrutiny, are, nevertheless, for the practical purposes of life, sufficiently appreciable.

On what does crime depend? Is it a simple psychical phenomenon, having as its essence logical errors? If so, the nearest approach to perfection should be found in the best-informed mind, and those who are wholly uneducated be of necessity the most criminal. Does the moral power, as it has been termed, exist so independently of the intellectual that it possesses a capability of carrying into practice innate aspirations, be they good or evil? If so, what mortal dare pronounce on the existence of guilt? Every day's experience disproves the first—the most limited observation refutes the second of these propositions. If, then, in the commission of crime neither the moral nor intellectual principle appears to act independently of the other, let us inquire how far they are identified, and to

what extent their unity is involved, when resulting in the exercise of acts open to the charge of criminality.

The human mind has been regarded as a series of progressive developments, consisting of intellectual powers, moral feelings, and instinctive propensities. The former two distinguish man from all other created beings: the latter are identified with and common to animal natures. We are led to regard the moral or affective faculty as occupying a medium sphere, which is, therefore, to a certain extent identified with the intelligence in its psychical direction, and associated with the organism in its physical realization. From this medium sphere emotions spring, which, receiving the further co-operation of the intelligence, become desires; these, however dependent for their existence, must be admitted to exercise a reactive power, and to constitute in their turn so many incentives to intellectual action. Such a reciprocity amounts to a mutual dependency, and experience demonstrates that this, as contradistinguished from a unity, exists between the intellectual and moral faculty. Unless the balance of their power be maintained, the following results ensue: If the intelligence be rightly directed, it will prove adequate to preserve the emotional feelings in their legitimate course, and, by impressing motives of the highest order, enable the will to successfully combat natural desires. If the emotional feelings be suffered to proceed uncontrolled, they thereby acquire such an habitude as affords them undue power in resisting the psychical suggestions associated with them, and further enables them to reject those innate counsels of the moral faculty or moral sense to which, under ordinary circumstances, they are wont to respond. At length, through such a process, the emotive feelings, acquiring the mastery, are enabled to not only involve the volition, but also to render the intellectual powers the active, though depraved, instruments for their gratification.

Many causes are thus adequate to produce a similar result. If the purely intellectual powers be interrupted in their action, they fail to direct the moral or affective faculty. When the normal relations of the organism become impaired, the emotive feelings, as being closely related to the personality, evince the change. Should the emotions, not controlled, through the insensible co-operation of both intellectual and moral spheres, acquire undue power, a want of harmony speedily

pervades the whole system, evidenced on the one hand by ill-regulated passions, and on the other by disordered functions. In fact, the relationship of these three is from observation proved to be so intimate and complete that he who would determine the question of mental soundness in connection with responsibility, without duly weighing the separate influence of each, but imperfectly estimates the importance of such a duty.

Feelings of pleasure and pain, being developed coincident with the maturation of the living structure, may be regarded as to a certain extent forming the natural basis or guide to each voluntary movement; thus furnishing the groundwork for all subsequent intellectual actions which such movements entail, since pleasure and pain, in their physical associations, by a process of assimilation, become identified with right and wrong in their physical relations, as something to be desired or avoided. Reasoning from analogy, the foundation of an ethical code—this moral sense to which we have alluded, or intuitive moral perception—may be considered as being identified with each mental constitution, in the same manner as the vital sense of material operations rests in every physical organization. Those principles in the lower animals, wanting the direction of reason, are wholly impulsive, constituting their instincts; which, resulting from the dictates of an unknown principle, appear not only uniform in animals of the same class, but are also performed without a knowledge or consciousness of their ultimate results. This instinct, requiring no experience for its guidance, fulfils to all intents the purposes of an intelligence; and since in brute life there is no accountability beyond the individual, the most perfect gratification of animal desires may be presumed as the *summum bonum* of their existence. Man's reason admits of no comparison with such instinct. Those desires he possesses in common with other animals rest not only within the control of his will, but are also capable of being influenced by the separate mental agencies which eventuate in its formation. Were it not so, life would present a perfect chaos of ungoverend passions, since, in addition to its natural impulses, artificial appetites become, as it were, self-engendered, the insensible results of habitual exercises.

That in man this moral faculty or moral sense, endowed

with a certain authority, exists, is sufficiently evident from our individual consciousness. We admit that the positive obligations of life, as regards their prudential relation, demands the guidance of the judgment, which preargues the possession of experience. Our moral instincts are, however, the promptings of natural principles, coexistent with, though for their essential being independent of, psychical perceptions; but not the less on that account requiring, for their proper development and direction, intellectual culture. Right is a positive term which admits of no perversion. A sense of right exists, independently of those intellectual powers which guide its operation. The whole world lives under a moral government. "Yea, and why even of yourselves judge ye not what is right?" asks our Lord. Again it is written: "The Gentiles, which have not the law, do by nature the things written in the law." Whence, then, proceeds crime, man having as a guide his natural conscience? Observation of life affords this reply: He is at the same time the creature of his natural appetites. Our study, therefore, of the manifold operations of the latter, as manifest in the world around us, and our careful analysis of the varied circumstances associated with each criminal act, promise to afford the best explanation of the question we are discussing.

Admitting in each the presence of an innate moral principle, it may be asked: Whence arises the wide range of differences observable in the ethical judgments of men, and how does it occur that those judgments are capable of being modified by their intellectual operations? To this we reply: The sense of moral perception does not in its practical application appear to be as uniformly guided as it is universally bestowed. The moral appreciation of the qualities of different actions, in reference to the same object, implies an elective power involving the exercise of the intelligence for their discrimination and its co-operation for their adoption and exposition. Though, then, the moral standard be fixed for all, ethical judgments are found to vary with many, not so much from any original diversity of their moral sense, but according to the acquired perceptions of existing relations as submitted to that sense. We have used the term "original diversity of their moral sense;" for we believe psychical analysis will sufficiently establish it as a fact that in the moral, as in the intellectual

constitution, individual dispositions will be found to exist, which, though amenable to general rules, are not the less on that account particular examples. This will be evidenced as we proceed.

Were this moral sense, as being an essential part of the human constitution, by itself capable of active exercise—that is, of not only determining on that which was right, but also of insuring its adoption—men should, in accordance with an admitted law of their natures, be not alone universally and intuitively, but necessarily, attracted to that which is good, its practice being essential for their immediate enjoyment and ultimate preservation. The intelligence would then be invariably occupied in performing moral exercises. We see that it is not so. Were we to regard morality as merely the issue of prudential considerations directed by rational self-love, the question still remains to be determined: Whence is derivable that regulating principle which, under circumstances of the greatest complexity, is capable of its uniform direction? These questions have worthily occupied the greatest minds. Their practical elucidation may be assisted by a reference to our individual consciousness, as well as to our general observation, when we shall be satisfied that many of our daily exercises must be referred to a principle of action occupying a middle sphere, where the mental and moral intelligence, as it were, meet, co-operate, or react one on the other. This psycho-physical plane, or "conscience," has been presumed to be capable of furnishing to every one an invariable rule of right or wrong. Metaphysicians and theologians have defined moral and religious duty as an accordance to such rule; while lawyers—with what propriety we have already stated—have made the test of responsibility, as identified with soundness or unsoundness of mind, in criminal cases to depend on the presumed ability or inability of the offender to determine on the recognition rather than the adoption of that which was right or wrong at the time of the commission of any particular act.

Before propounding the doctrine that the same standard of conscience appertains to all, we should establish the existence of their equal capability for the appreciation of right and wrong, not in its abstract, but relative sense. We use the term abstract, for we believe that a positive consciousness of evil appertains to every one in the commission of certain acts;

and that this consciousness, however perverted, is never wholly lost, inasmuch as should the intelligence prove inadequate to their recognition, the mere instincts of animal nature would rebel against them. That conscience is to be distinguished from reason may be inferred from the history of crime. That it is closely associated with the intelligence is demonstrated in the code of morality which savage nations possess, as well as in the fact that where the moral sense is non-existent, the powers of the understanding are either undeveloped or destroyed. "The wretch," writes Winslow, "devoid of conscience is of course morally defunct; but we must never forget that conscience is a relative, not an absolute, term, and that, like other faculties of the mind, it requires education, direction, and discipline." Allowing that moral commands are to be distinguished from positive duties, we must in our estimate of the latter admit that the just appreciation of their moral relations is essential for their proper guidance. "Every moral judgment is relative, and involves at least the comparison of two terms: when we praise what has been done, it is with the coexistent conception of something else that might have been done; and when we resolve on a course that is right, it is to the exclusion of some other course that is wrong." If, then, in the preference of one class of motives to another, the moral rule of action consists, a question arises: How is the value of various conflicting motives to be estimated? The answer rests: By the universal standard of right, which the intuitive perceptions of the individual, the general judgment of men, and the positive ordination of heaven, furnish to each. Is each one equally competent for their estimate? This is an inquiry, opening a wide field for ethical discussion, which we forbear to enter on, further than observation of life warrants, a limited range of which suffices to establish the truth of Stewart's remark that "Fortunately for mankind, the peace of society is not intrusted to accident, the great rules of a virtuous conduct being confessedly of such a nature as to be obvious to every sincere, well-disposed mind. It is in a particular degree striking that while the theory of ethics involves some of the most abstruse questions which have ever employed the human faculties, the moral judgments and moral feelings of the most distant ages and nations with respect to all the most essential duties of life are one and the

same."[31] Being led to seek for an explanation of the causes of the diversity of our moral action in a scrutiny of the agencies conducing to the development of the moral sense, we are impressed with the observation of an eloquent writer: "That the early repression of all the higher feelings, and the influences constantly at work to develop the lower, fail not to fix the standard of right and wrong at a very different point from that which a better education would have determined in the same individual." It is of importance to rightly estimate what this fact indicates; for from it we may infer that in individuals of such a class, while the functions of the understanding continue perfectly unimpaired, the passions may prove capable of inducing them to the commission of acts whose criminality finds an accordance in those habitual exercises of which they may be presumed to constitute but the exaggeration. In the study of moral insanity, its evidences will be found to rest in operations to which this accordance of the intellectual faculty appears wanting. On this apparent want of unison is based the difference between crime and this particular form of disease. Omitting those positive duties of life which are performed with the insensible approval of our moral faculty, we come to the question: How far is the voluntary exercise of our emotive faculties regulated by our conceptions in reference to the objects to which they are attracted? We are satisfied that the intelligence, if not chiefly instrumental, is at least essentially involved in all their deliberate exercises. It is not, therefore, easy to believe the emotive faculties can be altogether perverted so long as the conceptions which had previously, under similar circumstances, influenced their direction continue unchanged; while, at the same time, it is by no means difficult to admit that the change in our conceptions may be alone manifest through the affections with which they are associated, when, as Dr. Duncan observes: "Cases occur in which an estrangement of the moral sentiments takes place without any obvious lesion of the reasoning powers." If we go to the full extent of some writers, and allow the moral intelligence to be, *per se*, diseased, or "manie instinctive sans délire" to be present, while the reasoning powers are wholly unaffected, what else can we suppose but that every case of confirmed viciousness is an example of such a form of disease? As in the mental, so in the moral

constitution, the most marked differences are perceptible. It requires but slight research to satisfy the inquirer that many instances of crime are on record, and that many examples could be adduced to prove that such an original deficiency or natural perversion of the moral faculty appertained to some individuals as argued a brutality rather than depravity of their dispositions. The chronicles of crime and pages of history too sadly demonstrate that instances are not wanting, in which the most wanton and flagrant violation of the ordinary principles of humanity has been exampled by the acts of many whose conduct otherwise could not admit of a doubt respecting the existence of intellectual power adequate to appreciate the varied relations of their acts. Are such cases to be regarded as examples of "moral insanity?" If so, in what respect do they differ from others which may be adduced as evidences of wicked, depraved minds? Observation satisfies us that the same vice for its accomplishment adopts means which vary according to the natural character, education, position in society, and various modifying circumstances affecting the individual. How true is the remark of Dr. Wigan: "Place the individual subjected to morbid impulses in a position of impunity, so low or so high in the social scale that he is either above shame or below it, and we see how much of the morality of society depends on positive law, how little on virtuous self-restraint." Society, in seeking to disguise from herself this truth, calls the act of the one "wildness," of the other "crime," attributing the first to the weakness of the head, the second to the badness of the heart.

However open to disputation the origin of our moral nature may be, its use and the means best calculated for its guidance happily come within the observation of all. In the study of the latter we dissipate much of the obscurity of the former, and are practically convinced of the importance of recognizing in the mental constitution that same harmonious coadaption which, witnessed in our physical organization, illustrates a mutual dependency of the various structures constituting the whole; and further displayed by the various operations in the world around us, proclaims a unity of design as indicative of the wisdom of the Creator.

Among the principal of those means by which our moral nature is affected, we may enumerate education and associa-

tion. In regarding them as fitting subjects for psychical inquiry, we recognize the primary elements of national greatness and individual happiness. As man advances to physical maturity his mental powers simultaneously progress; moral and intellectual faculties become developed—desires, as contradistinguished from instincts, awakened. These, though identified with his moral nature, imply a power of reasoning; for, coincident with their development, a capability for the estimation of cause and effect is also manifested. As, however, no correct judgment could be arrived at without the due appreciation of data, entailing experience, one of two things must occur—either the instinct should guide the reason until such time as experience became established; or, as is the case, the value of data, *in initio*, be acquired from the experience of others, who by education lay the first step of that independent intellectual life which, through a similar process, had in their own persons become established. On this point we quote from Dr. Wigan: "The slow progress to physical maturity of the human species, compared with that of other animals, seems a provision for their longer pupilage and more extensive instruction. If this duty be neglected, or if the discipline be defective or erroneous, the animal grows up the most detestable combination of intelligence and physical force that infests the earth."

It is not our province to descant on a subject respecting which polemical arguments run high; yet considerations arise, from the nature of our present inquiry, which induce us to ask—Has crime decreased in proportion to the spread of education? "Has eating of the tree of knowledge diminished the power of the Tempter?" Are the best instructed the least vicious? So far from such being the case, it has in numerous instances been found otherwise. If we investigate the cause of this, we are led to the recognition of the moral, even more than the intellectual constitution of man, and are impressed with the truth that as there is an education of the intellectual faculties essential to man's temporal interests, so there is also the cultivation of his moral virtues no less essential for his present and eternal welfare. Proportionate to the maturation of the intelligence is the extension of its sphere of enjoyments; new desires are thereby awakened, new wants called into existence. How are these to be efficiently gratified or supplied, except by identifying man's moral with his intellectual

progress, and so, while imparting to the masses knowledge, inculcating principles which may make them understand that moral restraint is a duty and that their duty and interests are the same? Truly has it been written: "The chief means of controlling the passions and of keeping them within just bounds is to form a proper estimate of the things of this life, and of the relation of our present to a future state of existence, and of the influence which our actions in this world will have on our happiness hereafter." The best-informed mind requires to be regulated and subdued; regulated by the careful direction of the affective faculties to objects of legitimate attainment—subdued by the habitual adoption of such practices as denote that to the corrective influence which the various emotions exercise one on the other have been superadded motives of a higher and more exalted character, which the intelligence is enabled to place in successful opposition to the natural desires. It is to be lamented that, notwithstanding the most careful mental and moral cultivation, abject depravity is not infrequently manifested in the conduct of many having every incentive to a virtuous life. We are not warranted on this account in declaring that training of this nature is powerless in preventing the operations of vice. It is, however, true, that with such the desires may be inflamed without the understanding being strengthened, the imagination excited without the habits being improved, the cravings increased while the heart continues unpurified. Those cases are problems in human nature whose explanation would involve an exposition of the laws by which the Creator determines his moral government of the world. As our estimate of a benefit is proportionate to our conception respecting it, so our moral culpability must be presumed as being in a ratio to our capability for ethical decisions. In our psychical estimate of crime we cannot, therefore, reject the influence which education exercises, or should exercise, in fitting or enabling the mind to appreciate not only the impolicy, but also the immorality, of any particular act.

The influence of association on man's moral disposition has been recognized by every one who has investigated the progress of crime. Profligates congregate together; their socialism has for its root real practical evil. The depraved in mind and abandoned in morals find mutual attraction; they recip-

rocally justify each other from their inward accusers, while establishing for themselves a system of morality up to which they act. In tracing the progress of crime we recognize the self-abandonment of the natural mind, in which the disinclination soon gives place to an inability to perceive moral distinctions; as guilt with its skilful sophistry stifles each remonstrance of "the still small voice within," the conscience, through vicious practices, becomes in its sensibility gradually impaired, and ultimately ceases to respond. Moral responsibility is not in consequence removed. Were we to admit it as being so, we would thereby confer a premium upon vice; for as a man became thoroughly lost to a sense of right would his immunity from that punishment be established, which possibly might prove adequate at least to deter others from similar courses, should it even fail in reforming himself. The statement that similarity of disposition regulates intimacy has become a proverb: its truth as an element in the formation of our opinions cannot for a moment be lost sight of.

This intimate blending, intricate co-operation, and mutual dependency which the various faculties of a healthy mind preserve one toward the other must be carefully distinguished from their integral unity. We have observed that "in our analysis of mental activity, as evidenced through psychical actions, we are presented with a duplicate operation of an integral power, contradistinguishing the moral from the intellectual faculty." This it has been our object to maintain, being entirely impressed with the wisdom, practical utility, and truth of Winslow's observation that "these faculties, although co-operating and blending together, are so many distinct powers, differing in their modes of operation and subject each in its turn to characteristic aberration; but as the mind can be only occupied with one idea at a time, it is as a whole affected when under the influence of any specific lesion."[32]

The "mens sana in corpore sano" implies the free action of the mind rather than its free existence, since the relationship of the healthiest mind to the cerebral organization is too well established. In like manner would we associate the moral and intellectual faculties, and consider the normal mental condition to rest not so much in the mutual independency, but in the capability for the free co-operation of those separate powers. The free actions of one individual and the mor-

bid actions of another may be identical—moral excellence characterizing both. Again, the insane acts of one may be the habitual and premeditated acts of another, vice being the leading characteristic of each. In what does their difference consist? We are not at all times able to detect the positive existence of disease, though we may justly infer its presence; nor, having established its presence, can we always determine its nature. In such cases we form our diagnosis by negation—that is, by establishing what the abnormal condition is not, and so indirectly arriving at that which it is. It is thus that in our estimate of "moral insanity" the acts must be judged of by the motives, the motives by their relation to the mental condition, whose operations they may be fairly presumed as indicating.

Comparison as an important element in diagnosis cannot be too highly valued, the facility of arriving at truth being generally in the ratio of our capability of applying this test. In our investigation of the disease we proceed to consider, this will be abundantly manifested.

All examples of moral insanity which the records of criminal jurisprudence supply may, we conceive, be ranged under one of the following heads:

I. Cases in which the development of the moral feelings or affections is originally deficient.

II. Cases in which the perversion of the moral feelings or affective faculties occurs incidentally.

III. Cases in which the moral feelings become universally disordered.

IV. Cases in which the moral feelings are partially diseased.

The first class of cases is often involved in much obscurity. Education presupposes the existence of certain capacities common to all; its exercise demonstrates that these are variously extended to each. There are many whom no amount of intellectual culture would render competent to the discharge of duties performed without difficulty by others. Except on the supposition that an original peculiarity of mental constitution exists in such individuals, this fact is inexplicable. An analogous condition is manifest in the operations of the moral faculty, inasmuch as individuals in all respects similarly circumstanced display the greatest possible diversity of character.

Many without any unusual incentive to crime, and with every possible inducement to virtue, are observed to wilfully abandon themselves to evil practices, and from the commencement to manifest a disposition presenting a strange compound of intellectual power and moral culpability. Their disease is vice. With them Professor Heinroth's views are so far established that moral depravity is not only the first step to, but the real cause of, their mental derangement. Pinel has directed attention to numerous examples of this nature. The identity of their operations with those of vice is complete, from which they are alone distinguished by the exaggerated malevolence they display; since "without other inducement or advantage than the gratification of morbid appetites, acts of the most heartless and repulsive nature are by them being continually perpetrated." That to individuals of this class the emotional theory of insanity applies, we do not doubt. The primary cause of their mental derangement can be assignable to no other source than that abnormal excitement which, resulting from the uncontrolled gratification of the passions, too truly proves that they may be rendered so many "fevers of the mind." The question of responsibility under circumstances of this nature is one closely identified with the preservation of public safety and morality. Indifference to and negligence of those moral commands on whose observance the welfare and peace of society depend cannot be permitted. The interests of the community demand that they be preserved from the evil consequences which might ensue from the free gratification of vicious desires. The welfare of men requires what their universal voice declares—that when the animal nature is thus by the individual allowed to gain an ascendency, its powers should be chastened and subdued, in order that, being brought into subjection, the lessons of experience, if not the dictates of conscience, may thereby prove adequate to their better regulation. Fortunately, to this form of moral derangement the same rule applies which in physical disease is found to prevail, for as in the latter, when so perfect an analogy exists between organic affections as to render them closely similar, their treatment is usually equally so. In like manner we believe that in this affection, the same moral as well as physical discipline the legislature ordains for the reformation of the vicious is as equally applicable to their condi-

tion, except when it eventuates in the perpetration of a capital offence, and then it will generally occur that more marked grounds for opinions are not wanting.

The most difficult and complex propositions arise when the mental and moral powers seem equally defective. Few cases excited more interest than that of William Frederick Wyndham, heard in 1862 before Mr. Commissioner Warren—the petitioner being his uncle, a major-general in the British army who had attained high distinction. The most celebrated advocates and gifted lawyers of the present century—Earl Cairns, Lord Coleridge, Mr. Justice Field, Mr. Justice Hawkins, Sir John Karslake, Sir Charles Russell—appeared for the respondent and his immediate family; Mr. Montague Chambers and others, including the author, being for the petitioner. The petition alleged a connate mental deficiency which prevented the respondent exercising a sound mind sufficient for the government of himself, his manors, messuages, lands, tenements, goods, and chattels"—deficiency, within the interpretation of Sir John Nicholl, understood to mean not "that he was born either an idiot or a lunatic, but that his mind was naturally and constitutionally defective, and that its defect was not occasioned by any accident or supervening disease."[33] The commission lasted thirty-three days. Though the jury found in favor of the respondent, his costs were ordered to be borne by the estate. He died within one year after the verdict, having in the mean time been separated from such friends as he possessed, and wasted every shilling within his reach (£140,000) in companionship entirely unworthy of his birth and station, being a pauper at time of death, which took place in a low public-house. It was contended on his behalf that the maxim "*sic utere tuo ut alieno ne lædas*" was the only restriction our laws imposed in regard to economical prudence. The opinions of Blackstone and of others were relied on by Sir Hugh Cairns in support of the proposition that "prodigality which causes great houses to fall and hereditary estates to pass away, thereby occasioning that frequent circulation and transfer of lands and other property which cannot be effected without extravagance somewhere, is perhaps not a little conducive toward keeping our mixed constitution in its due health and vigor." This and the doctrine of Lord Hardwicke, "there may be a weakness of mind that may render a man incapable

of governing himself from violence of passion and from vice and extravagance, and yet not sufficiently under the rule of law and the constitution of this country to direct a commission," were urged with success on his behalf. Against Lord Hardwicke's opinion was quoted that of Lord Eldon: "I have reason to believe the court did not in Lord Hardwicke's time grant a commission of lunacy in cases in which it has since granted. Of late the question has not been whether the party is absolutely insane, but the court has thought itself authorized (though certainly many difficult and delicate cases with regard to the liberty of the subject occur upon that) to issue the commission, provided it is made out that the party is unable to act with any proper and provident management, liable to be robbed by any one under the imbecility of mind not strictly insanity, but as to the mischief calling for as much protection as actual insanity." The petitioner did not seek to place his case higher than this; keeping in view the observation of Sir John Nicholl: "Imbecility and weakness of mind may exist in different degrees between the limits of absolute idiocy on the one hand and of perfect capacity on the other." The trial was instructive as showing the value of evidence when submitted to a jury whom sympathy or prejudice could influence. Witnesses with equal opportunities to form opinions were in direct conflict as to habits, dress, manners, bearing, temper, and knowledge of the respondent. Medical experts of the highest position proved to be in a similar antagonism. "From his cradle to the age of twenty-one years," observed Mr. Coleridge, who appeared for his wife, "Mr. Wyndham was utterly neglected by all his family, with a set of second-rate tutors about him who did not understand and were incapable of dealing with their pupil." Mr. Karslake, on behalf of respondent, admitting he had not been wisely or prudently directed, asks, if he were as described, "Would he have been kept so long at Eton, or could he have induced gentlemen of education, ability, and position to live and travel with him?" Mr. Montague Chambers replied: "No young gentleman ever had more care and anxiety bestowed upon him; no young gentleman of his rank ever had more money laid out upon him; but trial after trial had failed, and his mind remained a barren soil incapable of cultivation." This was the comment on the absence of the "wisdom or prudence" referred to by

Mr. Karslake; high-sounding words when mental weakness on the one hand and commensurate moral deficiency on the other constituted a disposition impervious to instruction and incapable of self-regulation or control. Perhaps the severest criticism was that contained in the opinion of Dr. Conolly: "I believe that if Mr. Wyndham had one kind, virtuous friend he would get through the world very well."

Society, wise after the event, observing the effects of the finding of the jury, took up the question and quoted the dictum of Lord Hardwicke: "Possibly the law was too strict; and it might be useful in some cases that a curator or tutor should be set over prodigal or weak persons as in civil law," and advocated in its journals that such spendthrifts should have a curator appointed to hold office until *perfecta ætas* (25), so that although a person similar to the respondent be *sui juris* and of an age to exercise his rights, yet it woud be for his safety to insure that he did not hurt himself and his family by the mode in which he exercised them; the lord chancellor having a power of dispensation if a sufficiency of self-control was in the interim manifest.

In answer to the argument that the petitioner had desired to possess himself of the property of the respondent and to nurse his estate for his own benefit, Lord Justice Knight Bruce in a contemporary case[34] observed: "It was a mistaken idea entertained by many, that the finding by a jury that a person was of unsound mind necessarily involved an interference with his personal freedom. The court placed no further restraint upon a lunatic than was necessary for his protection, and several lunatics were under the protection of the court now residing with large establishments in their own houses."

As we write, a sad illustration of that prodigality to which Blackstone refers presents itself. A youth without previous training to spend a fortune wastes £250,000 in two years, and terminates his short career by inconsiderate forgeries, the criminal magnitude of which offence he appears to have but imperfectly appreciated. Found guilty on the charge of "*escroquerie*," in a foreign prison he has three months for self-examination. Surely it may be asked—Is there not a suggestive teaching in this? Had he in the multitude of his advisers no one compassionate friend? Is it not miscalled "freedom of action" that permits a youth to thus consummate his ruin?

The extravagances of Wyndham elicited the indignant censure of the press. Similar prodigalities, detailed through a vicarious authorship expressing fictitious regrets, constitute in the present time "one of the fashionable novels of the season."

The second class of cases, in which the perversion of the moral feelings incidentally occurs, is much less difficult in their recognition than in determining their responsibility. When we consider the various powers which, irrespective of religious sense, regulate the conduct of men; that influence which society, the laws, public opinion, and our mutual dependency exercise for the promotion of self-control and the maintenance of the general welfare, and then reflect on the capability of self-regulation which, consequent on such, is manifested to a certain extent in the conduct of many admittedly insane, we are struck with the preservative influence we each contribute to, and cease to be as much surprised as we otherwise would be, that when those corrective powers are removed, individuals in whom a defective capability of self-regulation is manifest should by their conduct betray the same, and, wanting that restraint which had hitherto existed, abandon themselves to the freer indulgence of those passions that mark the natural disposition of man as being essentially sinful and depraved. This condition, we conceive, may result from either of the following causes:

I. The abnormal excitement of the passions, consequent on some morbid physical condition.

II. The defective or imperfect development of the mind.

The first may result from either a morbid condition of the general system or a special condition capable of generally affecting the system. We believe that many cases of hysterical mania are examples of the first class, and that many local diseases afford illustrations of the second. That causes capable of morbidly exciting the passions are adequate at the same time to also affect the mental powers in their regulation of those passions, the majority of examples proves. The fact is, in many instances the general conditions of the system and the influence such conditions exercise on the intellectual powers are not sufficiently appreciated; and yet we require no proof beyond the experience of our daily observation to show that circumstances wholly unconnected with certain actions

or particular states of mind may lead to one or eventuate in the other when, pending the continuance of those circumstances, the individual becomes incapable of opposing the morbid influence they exercise. Familiar examples of this form of disease are also manifest, as has been indicated, in the unusual phenomena which occur with some females during the period of utero-gestation, as well as the difference of disposition and perverted states of mind that with them may be fairly presumed to be dependent on causes generally affecting the system, but having no special tendency to those particular manifestations to which they, from accidental circumstances, may be determined.

Morbid conditions affecting the intellectual system in a manner similar to that which Esquirol and Georget describe as indicating the initiatory stage of mania may, from whatever causes these morbid conditions proceed, in their primary development be manifested exclusively through the emotional faculty. It is quite possible that, pending the progress of cerebral disease, appearances of perfect physical health may be presented to the most careful scrutiny. Why disease of the brain should, not infrequently, manifest its presence through emotional operations, pathology fails to explain. Its doing so is too often demonstrated by the fact that changes in the affections, sad, lamentable, and at the time of their occurrence inexplicable, have been found to precede unmistakable and fatal outbursts of insanity. It may be that purely psychical changes as frequently occur; but inasmuch as they are assignable to so many causes, and without the presence of disease so constantly take place, they therefore escape detection; while the affective faculties, having a fixed relation, are in their alterations more immediately recognized. Heinroth and Hoffbauer have observed a form of mental derangement, of which the latter thus writes: "It is clear that mania may exist uncomplicated with mental delusion; it is, in fact, only a kind of exaltation, a state in which the reason has lost its empire over the passions and the actions by which they are manifested to such a degree that the individual can neither repress the former nor abstain from the latter. It does not follow that he may not be in possession of his senses and even his usual intelligence, since, in order to resist the impulses of the passions, it is not sufficient that the reason should impart

its counsels—we must have the necessary power to obey them."[35]

Before arriving at any conclusion in reference to cases of this nature, it is of importance to consider fully—

I. Those previous circumstances which have influenced or tended to form the moral character.

II. Those especial circumstances which have eventuated in the particular development of its affective operation.

On the first query—The psycho-physical relation or temperament, the influence of education, association, and habit, as establishing the individual mental constitution, must, in their mutual reactions and collective operations, be duly estimated.

On the second query—All physical causes adequate to react on the material organ for intellectual expression require the closest investigation. The influence an ascertained morbid condition is capable of exercising, not on an ordinary intelligence, but on the mind of the individual accused, demands the most careful scrutiny previous to determining the relation of the ascertained mental constitution to any particular development of its moral faculty. The question of responsibility in cases of this nature is therefore one involving the nicest exercise of psychical judgment.

The third class of cases, in which the moral feelings appear to become universally disordered, is closely associated with those last noticed. Their diagnosis rests on the recognition of an independency in existence, but unity in action, of the separate mental faculties as being characteristic of mental and physical health. Were proofs required to establish the reactive influence mind and body mutually interchange, we might quote a case of unusual interest tried in Dublin,[36] in which this proposition was painfully illustrated in the person of an educated gentleman, who, pending the constitutional inability for moral control consequent on the presence of nervous depression induced by an overwrought mind, suffered from such a perversion of the moral principle as led to the indulgence in irregularities which no one doubted his ordinary life was wholly opposed to, and his unclouded intelligence would have altogether repudiated. Winslow has directed attention to similar anomalous phenomena which are to be met with in certain stages of hypochondriasis. He observes: "The

phenomena may also manifest themselves not merely in the common forms of weak fancies as to bodily health or in unaccountable gloom, but also in a less understood form, in which the judgment is weakened and the individual gets committed to some intellectual folly in science or literature, religion or politics. The man is not actually insane; there is method in his madness; but his feelings are easily acted upon, his credulity is unbounded, and his actions consequently unworthy his reputation or his intellect."

When we reflect on the difference between men which education, association, and habit are capable of producing, we are led to the conclusion that motives or inducements to crime capable of influencing one individual are perfectly harmless in their operations on another, and that acts indicating a wilful viciousness in one too plainly demonstrate a morbid want of self-control in another. The comparison of those acts regarded as denoting the moral derangement of an individual, by determining the relations they may bear to the previous conduct and general history, lays the groundwork on which the diagnosis of this general condition rests. This is a question which, while for its rational decision coming within the reach of an ordinary intelligence, at the same time, for its medical solution, demands a close examination of the personality for the detection of disease; since observation assures us that many general and special sympathies may be evoked through its existence, adequate to so disturb the mental equilibrium that the moral power ceases to be regulated or controlled. It is true that in life many are to be met with to whom the ordinary observances of society become matters of indifference: who, from having preserved all appearances of moral rectitude, seem to wilfully abandon themselves to vicious practices. If the intelligence approves or co-operates with such immoral acts, of whatever nature they be, they thereby constitute so many illustrations of premeditated vice. If the intelligence does not approve and the immoral acts be opposed to its dictates, does not the commission of such acts argue as much the inability of the intelligence *quoad* the morals as any independent morbid condition of the distinct moral faculty?

So far we believe our views to coincide with those of Hoffbauer and others, who have justly observed that at the moment of the insane immoral act the perception is also disturbed.

There is nothing in the analogy of disease to lead to the inference that in cases in which the moral faculties are chiefly involved the intelligence should be presumed as sound, because no other evidence of disease is present except that manifest through the defective morals. On this particular point we adopt the words of Ray: "Notwithstanding the correctness of his conversation and his plausible reasons for his singular conduct, a strict scrutiny of the actions of a patient laboring under moral insanity, if not of his words, will convince us that his notions of right and wrong are obscured and perverted, and that his own social position is viewed through a medium which gives a false coloring to its whole aspect." In proof of this we may observe that the majority of well-marked examples of moral mania have eventuated in other more marked derangements of the intelligence. Thus the oft-quoted case of Frederick William of Prussia is adduced as an example of this form of disease; but surely any one who studies its different peculiarities will admit that there was abundant evidence of his general mental unsoundness, equally manifested by his monomaniacal desire for tall recruits as by his brutal conduct to his son. Dr. Duncan, in his essay on "Moral Insanity Unaccompanied by any Obvious Symptoms of Intellectual Aberration," gives the details of an interesting case, in which the moral relations of the sufferer appeared by him to have been wholly misconceived while the moral perversion consequent on this misconception, was the principal evidence of the disease. In his observations referring to this case, Dr. Duncan asks: "Are we justified from these things in concluding that there was no morbid condition of the understanding all the time?"[37] and adds as his opinion that which the majority of examples proves: "The morbid condition of the understanding, though obscure, was nevertheless real."

The fact that the knowledge of right and wrong is not prominently present to the mind, *per se* affords no proof that the moral principle is diseased. Observation has shown that the habitual indulgence of evil habits may stifle the voice of conscience and overcome those feelings which the commission of the same acts would occasion to less hardened individuals. Human life may be held at a pin's fee; and, as there is sad evidence to infer, a graduated scale for its destruction be adopted. "The abject atrocity of an act, its voluntary nature,

its perfectly gratuitous character, argues nothing in favor of a diseased moral principle further than vice, wickedness, and crime are competent to such an end;" nor does the circumstances of a man's apparently correct life of itself offer other than a presumption that the abandonment of those principles by which he had been regulated is the result of disease, even though it be confirmed by the seeming want of motives for transgression. Inducements to crime may not, to the same extent, have been previously presented, and our incapability of discovering motives is no proof of their non-existence, as was established on the trial of Courvoisier, convicted for the murder of Lord William Russell. The non-existence of motives elicited the sympathy of many, it being contended by counsel that "the most trifling action of human life had its spring from some motive or other;" yet eventually proofs of his guilt and an abundance of motives were not wanting. How are cases of this nature to be distinguished from the operations of vice, otherwise than by a careful system of analysis:

I. Of those agents capable of affecting the personality: When the fact of an hereditary predisposition, the presence or absence of constitutional or organic irritation, the pre-existence of any particular disease, or the previous receipt of any injury, especially if the pre-existence of that disease or the receipt of that injury was capable of affecting the nervous system.

II. Of the relation between the intellectual and moral power: When the education, association, habits, and general moral exercises, as constituting the previous history, must, in their contrast with the special character of the particular acts to be investigated, determine the ability of the intelligence not only to perceive their culpability, but to prevent their commission.

The fourth class of cases, in which the moral feelings or affections appear as partially diseased, demands the closest application of those principles just quoted, as for their detection the employment of comparison is primarily important.

If we look at the broad face of creation, we on all sides recognize evidences of divine wisdom in the universal adaptation of the many units forming the whole, and perceive a beautiful harmony to pervade the operations of nature, proving that in the world external to man there is a certain conformity

to a fixed standard; and leading us to the further inference that in the world internal to man equal ground for a similar opinion exists. The laws of nature are truths, however they may be misunderstood: our moral laws are equally as immutable, however corrupt the conscience may be. It is essential that similar harmony be regarded as indicative of the healthy, well-governed mind; for otherwise, many acts originating from a diseased condition might be attributed to a vicious disposition, and many vicious practices escape without punishment.

We have seen in our investigations respecting monomania that the evidence of unsoundness of mind in one may rest in opinions which in another would be perfectly inadequate to argue such a mental condition. In a similar manner a perversion or defective operation of the moral faculties may manifest itself by actions apparently consonant with soundness of mind and closely identical with the ordinary operations of vice. Dr. Rush observes: "There are persons who are moral to the highest degree as to certain duties, but who, nevertheless, live under the influence of some one vice. In one instance a woman was exemplary in her obedience to every command of the moral law except one. She could not refrain from stealing. What made this vice more remarkable was that she was in easy circumstances, and not addicted to extravagance in anything. Such was the propensity to this vice that when she could lay her hands on nothing more valuable, she would often at the table of a friend fill her pockets secretly with bread. She both confessed and lamented her crime."[38]

This particular manifestation of defective moral power, or kleptomania, as systematic writers have termed it, is universally admitted, and is at times advanced as a plea in extenuation of certain apparently criminal acts. It is not requisite to adduce examples. Their diagnosis rests on the recognition of this harmony we have premised. We enumerate the chief points of difference:

I. The criminal theft is the consummation of premeditated criminal desires. The insane acts, the result of a passing opportunity to gratify a morbid propensity.

II. The criminal acts accord to those of a generally vicious habit. The insane act opposes the ordinary individual exercises.

III. The criminal act is accomplished for the ultimate advantage to be derived from the illegal possession. The insane act is unthought of beyond the pleasure experienced in its perfection.

IV. The criminal steals that which may be useful, and subsequently conceals his deeds. The insane act has no reference to ulterior advantages, and seeks not to guard against eventual discovery.

V. The criminal in his select robberies has his associates. The insane in their indiscriminate appropriations admit of no accomplices.

VI. The criminal will persist in the denial of his guilty practices. The lunatic, though anxious to conceal his present intentions, seeks not to disguise his previous success.

Another much more serious and fortunately a rarer form of this partial perversion of the moral sense is manifest in that disease which has been termed pyromania, whose chief feature consists in an irrational propensity to incendiary practices consequent on an insane love for conflagrations. Many writers have alluded to this particular affection, and offered various suggestions respecting its pathology, some attributing its existence to an insatiable desire for light, caused by venous repletion, and others associating it with certain post-mortem appearances which indicate the base of the brain as that part of the cerebral structure which is more immediately implicated. This is an affection which must be studied on the same principle as that just described. As an isolated form of disease it is happily of rare occurrence, which is proved by the fact that lunatic asylums so seldom suffer from fire, though as an accompaniment to or result of other more general mental disorders, it is occasionally met with. In the case of Martin, the burning of the cathedral was the consummation of his delusive suggestions, a secondary, not primary, morbid manifestation.

To distinguish such a morbid action from the ordinary operation of the incendiary demands a knowledge of the individual habits, position, and relation to any motives conducing to the act; the investigation of all circumstances previous and subsequent to its commission. The latter are of especial importance; for when the insane act is being accomplished, the pyromanist manifests such monomaniacal enjoyment of the

scene as leads him to witness the success of his efforts; while the criminal speedily betakes himself to flight, and endeavors to conceal his participation in the transaction. In what respect responsibility attaches itself to acts of this nature, and to what extent the corrective discipline of asylums for lunatics with a criminal disposition might tend to their prevention, must be determined by the individual merits of each case. There is every reason to infer that the mind adequate to premeditate and perfect the accomplishment of such acts might be rendered the more capable of resisting those impulses which lead to their commission.

Other forms of partial moral mania are to be met with, involved in greater difficulty for their detection than those just described, inasmuch as their manifestations coincide with the ordinary operations of vice. Erotic mania may be ranged under this class. In this form of disease, not only may the nature and relations of the insane criminal act be fully understood, but the general intelligence conduce to its accomplishment. An idea which many writers with little philosophy and less observation formerly promulgated is now exploded—continence is no longer considered as a state of violence to nature. That a cultivated understanding and a vigorous mind will seldom suffer much from such a cause, observation of life establishes, in the persons of many whose vocation places them above suspicion. Such an affirmation, put forward as a general principle, must not be regarded as being intended to propound a positive rule. It is a physiological fact that the most powerful of all physical influences is that which the sexual function is capable of exercising on the intelligence. This is illustrated by the changes in disposition and thought attendant on the development of puberty, as well as by the mental declension which is usually observed to follow on the abuse or undue excitement of the generative functions. Mind and body thus mutually influence and react on each other. Education, reflection, habitual self-control, can so school the passions and subdue the emotions that, pending physical health, a perfect mastery is acquired over each somatic suggestion. A man may thus pass through life experiencing desires which he successfully subdues, when supported by principles adequate to do so. These desires, from their continued negation, are eventually placed in such complete abeyance that they may be

said to have scarce an existence. When, however, from any cause the healthy relation between the material and immaterial constitution becomes interrupted, as it frequently does in advanced life, certain phenomena may be observed in some instances to ensue. Resulting from the presence of local or general irritation acting specially on the sexual apparatus, the nervous sympathies connected therewith become to a corresponding degree aroused, and in the ratio that they are so, capable of attracting the attention to their excited condition. As the attention becomes engaged the local irritation increases. Unless suitable remedies be applied, on the increase of the local irritation follows a morbid excitement of functions adequate to resist the effort of the will for their control. The animal nature increases in power, while the intelligence is at the same time rendered less capable of resisting its morbid emotions, which have so far attained a double force, from the actual strength imparted by the local disease and the relative strength consequent on the diminished powers of the will. It is not difficult to admit that, as such a state advances, the consciousness of guilty desire may coexist with an incapability for its resistance; and that thus men whose previous lives were opposed to vicious practices become morbidly attracted to the commission of crimes that compromise an unblemished character and disgracefully terminate an honorable career. Prostatic disease has in this much to answer for. It may be asked, Should not a sense of religious duty and moral rectitude enable the person so afflicted to bear his suffering with resignation, and give him strength to oppose the progress of vicious desires? Surely daily attendance on the bed of sickness must satisfy the observer that such is the case. All, however, are not equally impressed with that religious sense which sheds its halo around creature woe. All are not so mentally constituted that they can bear up against the combined influence of physical excitement and mental debility. There is no more painful, no more melancholy form of insanity than this. Medical writings abound with instances in which the existence of local irritation, the presence of, it may be, previously undetected organic change, has satisfied impartial medical men that a blasted reputation, perhaps an untimely death, might have been prevented by the application of those remedies which medicine places within the reach of the least experienced of her votaries.

In the medico-legal investigations which may arise on such cases, the physician has a most trying and responsible duty to fulfil. Unhappily, age is not always characterized by virtue, nor are years a guarantee for that which is right. When on criminal trials a plea of this affection is set up, it is frequently the presence or absence of organic disease, be it general or local, which decides the case. None but medical men are competent for investigations of this nature. Most fully do we respond to Dr. Holland's observation: "Scarcely can we name a morbid affection of the body in which some feeling or function of the mind is not concurrently engaged. No physician can rightly fulfil his duties without an adequate knowledge of and constant regard to those important relations."

This grave question is at length receiving due attention. On the motion of Mr. Brudenell Carter, F.R.C.S., C.C., of great experience on the questions to be considered, a committee was appointed "to inquire into and report to the council upon the advantages which might be expected from the establishment, as a complement to the existing asylum system, of a hospital, with a visiting medical staff, for the study and curative treatment of insanity." Sir James Crichton Brown lent the weight of his high authority to the movement, on medical as well as economical grounds. The opinions of experts and specialists were taken and the result thus declared by the committee:

"That, in the opinion of the most experienced members of the medical profession, the knowledge which is professed with regard to the nature, prevention, and cure of diseased changes which underlie and occasion insanity is not commensurate with that which is professed with regard to diseased changes of other kinds, even those which affect other portions and other functions of the nervous system."

The committee further expressed their belief that the establishment of such a hospital as they recommend "could scarcely fail to be productive of increased knowledge of the subject of insanity, and, consequently, of increased means of prevention and cure." [39]

All honor to such public benefactors—pioneers in so good a cause!

The subject of moral insanity is one of almost infinite complexity. In the relative and mutual restraint the moral feelings exercise one on the other, and the capability the intelli-

gence possesses of directing the whole, the character of an individual rests. To analyze the power of each passion or emotion and to estimate the influence they possess would require the scrutiny of a single character for a long life. To subdue and regulate the passions is the end of religion: to enable the intelligence to do so should be the object of education. In our study of this disease we cannot reject somatic influences, however obscure their operation be. In them we view but the offspring of transgression, which, though it imparted to man the knowledge of good and evil, by no means assured him his Creator intended he should have a full and satisfactory knowledge of his moral government of the world, or a capacity for resistance proportionate to his knowledge of evil.

In the practical application of this inquiry we must be prepared for the meeting with many cases full of doubt, which our best and most anxious investigations may fail to elucidate. Under such circumstances to complain of any difficulty or seeming contradiction is only to complain that human intelligence cannot pass those bounds which the wisdom of the Creator has ordained; and though it may thus happen that at times the innocent suffer, we will indulge just grounds for hope that such examples must be rare indeed; and, on the other hand, should mercy incline the scale of justice and crime revel in the success of ill-deeds, we have both divine assurance and human observation to attest that "seldom hath punishment, though lame of foot, failed to overtake a villain."

These remarks may be terminated by the following conclusions, deducible from the previous observations:

I. By the term moral insanity we express mental unsoundness, chiefly evidenced through the moral or affective faculty.

II. Though the moral and intellectual faculties appear to be, in their abstract exercises, capable of independent action, yet in their affective operations they mutually blend together and co-operate.

III. Analogous differences are observable in the development of the moral as of the intellectual faculties.

IV. Those differences are such as seem to impart a special character or disposition to each.

V. The intelligence is, in the healthy, properly-regulated mind, capable of controlling and directing the moral exercises.

VI. The moral or affective faculty, being closely associated with the sensational, is therefore in nearer relation to the personality.

VII. Diseases affecting the personality may occasion morbid changes in the moral disposition without immediately involving the intelligence.

VIII. From the intimate blending, intricate co-operation, and mutual dependency of the separate mental faculties, causes producing abnormal action in the one usually eventuate in derangement of the other.

IX. Though in derangements of the mind the moral faculty appears primarily and solely involved, in many instances the non-development of intellectual unsoundness through other manifestations cannot be received as proof of its non-existence.

X. The sense of moral perception is found to vary according to the nature and extent of the guidance it may have received.

XI. The moral faculty, though incapable of determining positive duties, is adequate to oppose intellectual suggestions in such exercises as more immediately involve the moral perceptions.

XII. A want of accordance between the moral and intellectual faculties may proceed from either undue excitement of the moral or inefficient exercise of the mental powers.

XIII. Those causes adequate to affect either faculty must be carefully sought for previous to offering an opinion.

XIV. That as those are causes of a physiological, pathological, and strictly medical nature, irrespective of their ethical, logical, or legal relations, their proper estimation requires such a combination of knowledge as none other than a psychopathic physician could be reasonably expected to possess.

CHAPTER IV.

IMPULSIVE INSANITY.

In the study of those insane states in which neither the moral nor intellectual faculty is, of necessity, inadequate to appreciate the relations of a particular act whose commission is alone to be accounted for through the admission of an irresistible insane impulse, we are led to inquiries of even greater complexity than those which have previously occupied us. The investigation is one that demands on the part of the psychologist a mind free and unbiassed, prepared to receive the mysterious realities of nature as truths, and to reason on those realities. In no form of disease is it more essential that the physician be endued with that which, for want of a better term, we designate as medical faith, or just confidence, the insensible growth of experience. This alone can regulate the judgment under circumstances when the ordinary principles of medical science seem to be shaken to their very foundation.

Like many other diseases, this particular affection may manifest itself through phenomena at once proclamatory of its true nature, or become so engrafted on pre-existing affections that its entity is lost in the lesion with which it is associated. To hope that, under such circumstances, truth will not be beset with many difficulties, is to assume a pre-established uniformity for the various actions to be adjudicated on; which assumption, however essential for and verified in the exact sciences, is, nevertheless, but little warranted when considerations embrace the varying phenomena of life. We venture, therefore, on the apparently paradoxical assertion that the greatest danger of modern medicine seems to rest in its miscalled rationality—that is to say, in the growing tendency to require demonstrative proof of the modus operandi of physical changes, as well as of psychical actions; forgetful that the first are not infrequently beyond reach, while the second,

however intimately, or, as the highest authorities would lead us to believe, however invariably, they may be connected with special organic conditions, still present in their abnormal operations such strange diversity as must ever render their diagnosis and treatment the peculiar province of the experienced physician. We believe that, by thus confessing the obscurity and difficulty of many psychical investigations, we in no wise detract from the value of that knowledge physicians possess, but rather advance the scientific status of medicine in admitting its practice to be essentially dependent on the study of analogies; and further, by proclaiming that arguments cannot be reliable when the principles they would maintain are untrue, place such theory as is derivable from the collateral sciences in its proper position as an aid for the explanation of facts rather than the foundation on which they rest.

Differing altogether from either of those forms of disease we have been considering, and yet involving many of the prominent features of each, the diagnosis of impulsive insanity may be stated to rest in the application of principles already set forth as regulating opinions for their separate recognition. Thus it will occur that in a particular case the proof of this affection, as indicated in the act to be investigated, accords to the operations of criminal desire; while the mental habitude of the accused favors the opinion that from such it had originated. Again, it may happen that a mind whose previous exercises afford no clue to the mystery becomes amenable to this form of disease. In either of these instances the history of the case acquires separate value: in the one, involving the question in positive obscurity; in the other, investing its solution with a negative certainty. The fact is that in this particular manifestation of insanity, pending our inability to offer such explanations as may admit of proof, we take refuge in that asylum where vague doctrines, crude notions, and ingenious speculations find their resting-place, and with confidence appeal to the lessons of experience. Accordingly, in considering this as a peculiar affection, it is important that we define how it may be distinguished from those impulsive movements which result from monomaniacal conceptions, or those criminal acts which proceed from a morbid perversion or seemingly indicate a profligate acquiescence of the moral principle.

With this object we proceed to reiterate some few of our previous remarks.

In our investigations respecting monomania we have seen that criminal acts may be the result of delusive conceptions, and that though the intelligence be adequate to recognize the civil and ethical relations of the act, yet, under the influence of the delusion, it may still find not only grounds for its justification, but be also fully competent to organize the means for its accomplishment: the diagnosis of such cases resting in the appreciation of the monomaniacal condition.

In our consideration of moral insanity we perceive that, consequent on the existence of that form of disease manifested chiefly through derangement or perversion of the affective faculties, a capital offence might be perpetrated whose commission, according with previous manifestations, should tend to identify insanity with vice: the diagnosis of such cases being full of difficulty, as demanding a close and careful analysis of those material and immaterial agencies directly or indirectly conducing to such an event.

"Reasoning madmen," whether the mind or morals be diseased, are always the most dangerous and difficult of the cases arising for adjudication. It seems preposterous to argue that deliberation and cunning adequate to devise and to await opportunity should not entail commensurate responsibility. Many humane men believe in the deterrent effects of capital punishment, and would in this class of cases desire the exaction of the extreme penalty, affirming that the general good demands so jealous a protection that the smaller infidelities of the mind should not prevail against the larger claims of public justice; adding that the mere fact that an impulse is not resisted is no proof that it is irresistible, and that punishments exercise a deterrent effect even on the insane mind. When thin partitions divide insanity from crime, if wrong be done it can only be by the verdict of a jury approved by a judge; the public safety, which includes that of the accused, is thus assured of a twofold protection.

The disease which we would now describe is one in which the act is impulsive, not uniformly complicated with mental delusion or moral perversion, except so far as may be manifest in its commission: one that the previous history affords no direct guide to, and the subsequent conduct is also inade-

quate to explain; the morbid impulse neither of necessity originating nor terminating with the insane act. Winslow has afforded many examples culled from various authorities of this form of disease, of which the following may be regarded as types: "In 1805 a man was tried at Norwich for wounding his wife and cutting his child's throat. He had been known to tie himself with ropes for a week to prevent his doing mischief to others and to himself." "A man arrived upon the Pont Neuf, he rushed violently to the parapet and precipitated himself into the Seine He was seen by some of the bystanders, who drew him out of the water and saved his life. After some days of complete restoration, his friends asked him the reason of his strange conduct. He replied: 'I cannot give any account. I am in the happiest situation in the world. I have only to play with fortune and with men. I have never been ill. I do not know what troubles may come upon me. I can only recollect my arrival at the Pont Neuf and my recall to life.'"[40] Wherein rests the explanation of these cases? Ordinary principles fail to elucidate their essential nature. Are they not, therefore, the more instructive and valuable? Such illustrations of the secret workings of disease constitute so many landmarks in medicine; for admitting the truth that natural phenomena are alone explicable by natural processes, we are led to inquire how far our observation of many sensible operations enables us, in the absence of other data, to infer the nature of that process by which results of this character have been perfected.

It may be asked: Do we not thus recognize and confirm that absolutism in medicine to which our previous sentiments are opposed? We reply: By no means; since physicians, in regarding every psychopathic question as one presenting both psychical and physical relations, thereby recognize a diversity of agents as conducing to a similar result. It becomes an object of the greatest practical importance to determine, if not the actual, at least the relative value of those several agencies, the climax of whose operations is rendered manifest in insane impulsive acts.

In sound health, the direction of the motor powers is intimately associated with the regulation of the emotional agencies. Our actions being, under such circumstances, free and uncontrolled, we possess not only the capability of selecting, but

also of adopting, any particular line of conduct; the moving power and the power moved being equally amenable to the direction of the will. We have described the will as "the ultimate decision which the moral and intellectual faculties conjointly determine." That the will does not wholly rest in the moral faculty is proved by the circumstance that we frequently act in opposition to our strongest inclinations. That it is not a simple intellectual result is demonstrated by the emotions experienced in our actions. The very fact of a will denotes, on the one hand, a capability of perception as requisite to establish a choice, and, on the other, the existence of criteria for the guidance of estimation, which presupposes our recognition of a moral scale. The will may, on such an assumption, be regarded as the expression of the psychical and ethical reactions; identified with neither sphere, yet resting in their relations and eventuating according as those relations may determine.

In the ordinary affairs of life the will rests in abeyance; for the moral and intellectual powers preserve such an equilibrium that our actions result without the necessity of its being aroused, the conduct being regulated by such a scale as the imperceptible reaction of the moral and intellectual faculty has afforded. When, however, circumstances arise which specially implicate either the moral or intellectual faculties, the will, as being identified with the individual habit, by insensibly directing the attention to one class of circumstances, so far diminishes the force or power of another, or, by practice, proves adequate to strengthen a peculiar associating principle to such a degree that it acquires a command over a particular class of ideas; but beyond this we cannot recognize its influence. To speak of the will as being instrumental in guiding the conduct when the mental operations are defective, is to ascribe a capability to an effect which we would thereby deny to a cause—a process of reasoning altogether fallacious; for except as the exponent of the animus, the will has no real existence. They, then, who would speak of an insane individual having his acts within the control of his will—using the term will in its true signification—and being therefore responsible, must regard the will as some extraneous production—a kind of *tertium quid*, factor as well as product—the responsible offspring, as well as agent, of the irresponsible mind. There

are those who, entertaining such views, would argue a partial responsibility for the insane. This doctrine has been energetically condemned as being both false in theory and dangerous in practice; calculated to prevent any approximation to soundness in medical opinion, affording psychopathic problems for solution, in which both the elements of discussion—the criminal act and the unsoundness of mind—are thereby constituted indeterminate items from which it is in vain to seek a determinate result.

There is little doubt men are often led by vicious habits or the force of passion to act in such a manner as renders them the "creatures of impulse"—which we interpret slaves of an irregulated mind; when, for the time being, they are in a somewhat similar position to those driven to action by an insane stimulus. We must guard against confounding analogies with facts, nor for one moment identify that unsoundness of mind—or, to speak in terms less likely to be mistaken, that depravity of mind which results from vice—with that unsoundness of mind which we recognize as constituting insanity. But slender barriers may separate the two. In the former, the want of mental control has been voluntarily induced, and is capable of being aroused to a sense of what is right, being in truth but a submission to the evil promptings which beset humanity, whose discipline and guidance it is the object of religion to accomplish and of the laws to enforce: in the latter it is disease and not vice which triumphs. It is a self-evident proposition, that for the practical purposes of life all ethical or logical similitude between the two is lost the moment we pass beyond the particular act.

We are conscious that for the regulation of our conduct the mind carries on many intellectual processes, which, though leaving no direct traces in the memory, are not without exerting a material influence on the disposition, with which the will seems to be identified as the instinctive expression of such unconscious operations. These mental processes continue until some event occurs which interrupts the routine of their passive action, when it becomes a question as to whether the admitted obligations of acknowledged truth or the dictates of a depraved humanity gain the ascendency.

In the same mind, the consciousness of that which is right is not always adequate to insure its adoption, unless the mind

be strengthened by motives which it places in successful opposition to the natural desires. In this inability is exemplified the natural condition of man: a fact involving a psychopathic problem which sacred and profane writers alike attest. "The good that I would, I do not; the evil that I would not, that I do," St. Paul exclaims when lamenting the weakness of his humanity. Cicero arrived at the conclusion of a perpetual internal conflict between right and wrong from philosophy alone. Ovid observes:

> "Sed trahit invitam nova vis; aliudque cupido
> Mens aliud suadet—video meliora, proboque,
> Deteriora sequor."

Araspas declares: "I plainly perceive that I have two souls; for if I had but one, it could not be at the same time both good and bad; it could not at once act both virtuously and viciously, or will at the same time to pursue and avoid the same conduct. But, having two souls, when the good one prevails I act virtuously, and when the bad one prevails I disgrace myself with vice." Were we in the healthy individual to recognize such mental conditions as sufficient exculpation for illegal acts on the grounds of their being involuntary, we should thereby afford full range to licentiousness and remove the necessity for that mental and moral cultivation which is the only effectual security against grossness or crime. To say that vice is involuntary because the dictates of conscience oppose its commission, while the depraved appetite triumphs in its accomplishment, or to presume that responsibility is lessened because men are conscious of the wrong they commit and lament their inability for resistance, is simply to afford full scope to the worst passions of our nature. That free agency is permitted to man and the capability of acting with a perfect sense of responsibility identified with the healthy condition of his mind and body, all must believe who would expect happiness here or hope for a future hereafter. When, then, we speak of crimes being the result of an insane impulse, we declare the individual perpetrating them to be an automatic instrument in which the will has been replaced by a morbid stimulus, the guidance of the mind being wanting for other appreciation of the act than such as is necessary for its accomplishment.

If these opinions be correct, we seek to explain the cause

of the impotence of volition characteristic of the disease under consideration, by an analysis of the several agencies which observation points out as adequate for the production of phenomena similar to those observable in insane impulsive acts, and become the more convinced of the close and intimate reactions existing between the physical instrument of thought and the vital principle, and those active agencies of which it is the source.

That a very marked association exists between the emotional feelings and the motor powers, maintaining them in perpetual reaction, is abundantly proved by the fact that in extreme states of mental excitement, when the emotional feelings are those principally implicated, analogous physical manifestations, as convulsions, etc., not infrequently ensue; while in other constitutions, in which the psycho-physical sympathies are less acute, the emotional feelings, though not proceeding to the same extent, still find in violent physical exertions their greatest relief. In illustration of this we might adduce many familiar examples. When the mind is adequate to regulate the emotional feelings it may determine their external manifestations, and in order that it do so it is requisite that the agency of the will be exercised for their physical exposition or their repression. When, however, the mind is not adequate to such an end, a simultaneous accordance and development of psychical and physical phenomena ensue. The emotive faculties direct the motor power according as they are themselves attracted, and so impulsive actions result, in which the will has no part. The direction of the motor powers being dependent, in a great measure, on the regulation of the emotional agencies, demands that their harmonious co-adaption be preserved—that is to say, that the existence of pathological and metaphysical freedom be determined in those cases where the question of responsibility for impulsive acts comes to be investigated; when, should it appear that the healthy operation of either sphere is interrupted, the physician may, from his scrutiny, be enabled to estimate the influence such interruption is adequate to exercise on the conduct of the individual under examination.

The examples of this disease present two distinct forms:

1st. Cases in which the impulse exists, and the motor powers are *in initio* under control.

2d. Cases in which, simultaneous with the impulse, is the accordance of the motor power.

While confessing our inability to offer any determinate pathological explanations for the elucidation of cases of this nature, we believe we are not without sufficient grounds to infer that sudden and apparently unaccountable outbreaks of insanity must be regarded as either the effects of mental reaction, in which an effort is made to relieve the mind of a cumulative morbid tendency, the consequence of chronic, deep-seated nervous disease, or that their occurrence is but the first indication of such cerebral changes as are the prelude to incurable and not infrequently fatal results. Winslow, many years ago, observed in reference to this point, when speaking of impulsive homicides: "If such cases were attentively examined, I believe that in every instance the murderous impulse would be found to have been preceded by a derangement of the bodily and mental health which has escaped observation." The truth of this statement is each day established, since insane impulsive acts will be generally found to derive their proximate origin from any cause capable of interrupting the seemingly healthy operation of what is subsequently admitted to be a diseased mind, or adequate to particularly attract the depraved attention: causes may rest either in a severe mental shock or some incidental occurrence, apparently unconnected with the morbid phenomena they so materially contribute, not to originate, but to develop, a feature in this particular form of disease that must be considered as characteristic.

Impulsive insanity, which might perhaps with some truth be regarded as being analogous to a psychical convulsion, has been found to present a close similitude to other affections of the nervous system, in which the physical structures are those more immediately implicated. Its uncertain and variable nature, its recurrent character, its tendency to arise from that which we may term psychical sympathy or imitative propensity, so fruitful a source of neurotic affections among those so predisposed, afford strong presumption of its nervous dependency. Its general physical predisposing causes are identical with those known to operate injuriously for the production of all mental disease. The special physical predisposing causes include hereditary transmission, the receipt of injuries, particularly of those affecting the cerebral structure, irritations

at the great nervous centres, conditions of the system conducing more immediately to congestion of the vessels of the brain, as the chief and most frequent. Of the importance to be attached to the first of these physical causes, all writers agree. Our appreciation of the second must be guided by the nature and extent of the injuries rather than by the period which has elapsed since their receipt. The third entails an analysis of the psycho-physical sympathies. The practical value of the last, or cerebral congestion, as an element in the formation of diagnosis, is not infrequently lost, since we are, from observation generally, deprived of the means of forming an accurate opinion of the state of the circulation previous to the commission of the particular offence; and though the patient be seen immediately after, the physician cannot exclude the influence of that excitement attendant on or consequent to its perpetration. The knowledge that many who manifest a tendency to impulsive acts suffer at the period of their commission from cerebral congestion, while offering a valuable suggestion for the treatment of those known to be so affected, at the same time affords a pathological association which, when considered in combination with other elements for the guidance of opinion, becomes of the first significance. Damien, who attempted to assassinate Louis XV., persisted to the last in saying that had he been bled that morning, as he had wished, he would never have made the attempt.

Mrs. Brough, tried for the murder of her six children, in her statement of the facts adduced on her trial affirmed that immediately previous to the desperate act, while being mentally and physically depressed, "there was something like a cloud over her eyes;" that, intending to cut her own throat, she possessed herself of a razor for that purpose, when she experienced the impulse to also cut the throats of her children, to whom she had previously manifested a mother's kindness. Having detailed the manner by which their death was accomplished, she adds: "I then lay down and did myself. I can't tell you what occurred for some time after that, till I seemed weak and found myself on the floor. That nasty great black cloud was gone then."[41] Buranelli, for some days previous to the commission of the crime for which he was executed, suffered from pains in his head, and on the morning of the day in which the murder was committed complained of "an irre-

sistible force pressing on him." In many points these last two cases present an analogy. In both of them the nature of the act itself afforded the strongest evidence of insanity. It would have been well for humanity and justice had that analogy been further sustained, and the medical protest signed in behalf of the latter received that consideration which the solemnity of the interests it involved and the high integrity as well as ability of those physicians whose opinions it represented ought to have insured.

Arthur O'Connor, tried on the 12th of April, 1872, for presenting a pistol at the queen and attempting to force upon Her Majesty a petition, combined in his person many of those conditions believed to predispose to this form of disease. He was a grandnephew of Fergus O'Connor, of Chartist notoriety, who had for months been an inmate of a lunatic asylum. He was of a scrofulous constitution, had a misshapen head and an irregular spine. One month previous to the offence he had received a severe blow, leaving a lacerated wound on his temple. He suffered from intense headache and sleeplessness. On the night before the public thanksgiving in St. Paul's for the recovery of the Prince of Wales—29th February—O'Connor endeavored to gain admission to the cathedral armed with a pistol and knife, for the purpose of compelling the queen to sign a paper purporting to give free pardon to certain political prisoners. Prevented in his attempt, he succeeded two days afterward in secreting himself in the entrance to Buckingham Palace; and getting close to the royal carriage with pistol in one hand and paper in the other, was arrested when apparently taking aim. Sir John Coleridge, Attorney-General, appeared at Central Criminal Court to prosecute. Medical treatment and prison regulation had restored the prisoner to apparent health. He pleaded guilty. Being under age, his family raised the question of his sanity and ability to plead. Evidence was given of his ordinary habits being quiet and unobtrusive, and that he was a youth well read and studious. Dr. Harrington Tuke stated the prisoner had informed him the idea suddenly entered his head to shoot the queen, and he determined to do so. With rare cunning he evaded detection, and, were his weapon loaded, certainly had opportunity to carry out his intention. He had, however, omitted that detail. Dr. Tuke regarded his case as the immediate develop-

ment of hereditary disease, and one presenting a very dangerous form of "reasoning insanity," or the "folie raisonnée" of French writers. Prisoner stated, after the excitement of his arrest had subsided, "the scales had been removed from his eyes." Evidence of his ability to then plead was given, and the jury found for the crown. Baron Cleasby interpreted the expressions used by the prisoner to indicate a moral consciousness of wrong, their obvious meaning being that the cerebral congestion had passed away, and observed to the prisoner, "There is not the slightest doubt there is no insanity in you, if that expression was a genuine one." He sentenced him to twelve months' imprisonment with hard labor, and one whipping of twenty lashes with an instrument called a birch rod.[42] Having acted as counsel for the prisoner's family on this trial, I have since ascertained he was not whipped, neither was he detained in prison, but, with government help and aid of friends, proceeded to Australia. From that country at the end of the year he unexpectedly returned, and was found under somewhat similar circumstances concealed in Buckingham Palace, and, without renewed publicity, placed in a lunatic asylum. Dr. Tuke was my informant of these details.

These examples of the influence of cerebral congestion find their further corroboration in the fact that many most determined suicides have, as soon as the depletion from their self-inflicted wounds reduced their circulation, not only manifested the greatest anxiety for life, but on their recovery have been perfectly cured of that morbid tendency which had rendered their tenure of existence alike miserable and uncertain.

Failing, however, in this, as in other forms of mental disease, to establish any fixed pathological relations, yet acknowledging the importance of all physical associations, we are led to the closer investigation of those other circumstances which, in the estimate of any particular impulsive act, should influence our opinion. These considerations may be conveniently ranged under two heads:

1. Those having relation to the individual accused.

2. Those relating to the special character of the criminal act.

Under the first head, all that refers to the personality must receive the closest psychical scrutiny, when, in addition

to special points mentioned as demanding investigation, every physical derangement becomes an important element in diagnosis whose value is proportionate to the influence experience affirms it may be capable of exercising. But some one exclaims, "So many individual differences exist, both in the physical and mental constitution, that the result of their reactions varies in each particular case." We have premised this, and declared that it is only by bearing in mind what those laws are which operate in the production of phenomena, and by weighing the possible modifications they are adequate to mutually exercise, that anything like accuracy in opinion can be approximated.

It becomes a duty to investigate the different circumstances which influence the relation of these laws. By reflecting on the nature of agencies which have proved adequate to the production of known phenomena, we are, from either the presence or absence of these agencies, furnished in any particular case with a certain amount of positive or negative information. It will be at once admitted that causes capable of producing extreme results in one constitution are apparently harmless in their operations on another. Gastro-intestinal irritation will, for instance, in one individual give rise to the severest form of convulsion, and a terrible train of anomalous symptoms ensue; while in another its presence is only marked by the local inconvenience thereby occasioned. Though the conjunction of events must be considered as apart from their connection, yet when they stand apparently in the light of cause and effect, we become impressed with the necessity of inquiring into the reason of such a difference between individuals exposed to the same influences, and are led to an estimate of those physical sympathies which are in some adequate to place the whole system at the mercy of a single point of irritation. It is found that in such the local excitement prevails, because the constitution is adapted for the same; and that the constitution appears to be adapted, because the local excitement has prevailed. Causes, acting and being acted upon, move as it were in a circle, the centre round which they revolve being the source from which the irritation present had primarily originated; the secret predisposition resting in some physical specialty, either congenital or superinduced. This individual aptitude for and uncertainty in the eventuation of

disease is also illustrated in mental affections. The latter is equally without a rule by which to connect psychical and physical operations, or associate general psychical conditions as the necessary accompaniment of any abstract physical phenomenon. If we look further for analogies which would lead us to infer so close a similitude as to almost argue a connection between this form of insanity and other lesions in which the nervous system is principally engaged, we have them amply supplied in the fact that psychical sympathy or imitative propensity is one of the most fruitful sources to which insane impulsive acts are to be attributed.

In his paper read before the Académie de Médecine, 2d May, 1848, M. Belhome offers many valuable remarks in reference to the particular effect of political emotions as productive of partial mental derangements. As we review the events which in that year revolutionized the Continent and extended their influence to our very hearths, we are led to believe that many of those changes resulted from the widely-extended operation of psychical sympathy—that as, in physical expositions of nervous derangements, imitative propensity originates similar affections in those in whom the predisposition exists, so in an analogous manner the psychical operations follow a similar course when a morbid sympathy permeates the masses, among whom many are to be found keenly susceptible of its particular influence. The study of the great French Revolution must ever remain, for the psychologist, an era of surpassing interest. Of the events which then occurred we may observe, as Hecker did when speaking of the epidemics of the middle ages: "They are a portion of history, and will never return in the form in which they are there recorded; but they expose a vulnerable part of man—the instinct of imitation."

We desire not to quote history further than it affords illustration. For this reason alone is it permissible to draw aside that veil of oblivion in which time has vainly sought to envelop the then events, too terrible for recital in detail. It is enough to adopt the words of Carlyle: "Whatsoever is cruel in the panic-frenzy of twenty-five million men, whatsoever is great in the simultaneous death-defiance of twenty-five million men, stand in abrupt contrast near by one another; unarmed truly, and undrilled, but desperate in the strength of frenzy." This is a true psychical record of the situation, nor is the ex-

planation less accurate. "Very frightful it is when a nation, rending asunder its constitution and regulations which have grown dead cerements for it, becomes transcendental, and must now seek its wild way through the new chaotic—where Force is not yet distinguished into Bidden and Forbidden, but Crime and Virtue welter unseparated in that domain of what is called the Passions: of what we call the Miracles and the Portents." Surely M. Belhome could not better this description of a time when "pity lost in rage and fear" witnessed thousands of innocent lives sacrificed to the wild justice of revenge at the hands of a nation in the delirium of revolution revelling in a Saturnalia of blood. "History," adds the illustrious sage, "tells us many things, but for the last thousand years and more what things has she told us of a sort like this?" And yet the revolutionary era was not without many examples which may be appealed to as standing in bold contrast to its grosser parts. The humblest of artisans vied with leaders of the aristocrats in teaching their assassins how to meet death without fear. The most gifted of both sexes suffered, and were strong. Those distinguished in art, science, philosophy, and law were intermingled with the most debased in one common massacre. Cultured progress and civilization being for the time effaced, the French capital, if not the French nation, appeared to be remitted to primitive barbarism. "The ambient atmosphere of transcendentalism and delirium" extended from Paris to important cities that joined in the mad debauch. The Carmagnole, in its "rude whirl-blasts of rags," affording to the sans-culottes opportunity for savage rejoicing at indiscriminate slaughter offered to that "sharp female called La Guillotine," whose thirst did not abate until she drank the blood of the very miscreants who had called her into life. The number of victims was counted by thousands. In the first three months of 1794 they reached 281. In May, 324 were executed; in June, 672; in July, 895, without reckoning Robespierre and his party executed at the end of that month. As many as 67 perished in one day, 7th of July.[43] If anything could add to the horror, it is the following quotation: "At Meudon," says Montgaillad, "there was a tannery of human skins, such of the guillotined as seemed worth flaying, of which perfectly good wash-leather was made for breeches and other uses."[44] The writer whose figures have been quoted and

whose statesmanship gives weight to his admonition—Lord Brougham—speaking from his deep study of the events, fortified by personal conversation with many of those most active in their attempted direction, cautions us "not to permit prejudices to warp our opinions or arrest the judgment required by the interests of truth and justice," and adds: "It would be equally contrary to both were we to exclude from our consideration the extenuating tendency of the undeniable fact that all men in those times were more or less under the influence of the temporary delirium which rendered them alike insensible to their own sufferings, blind to their own perils, neglectful of their duties, and regardless of other men's rights."

The political significance and teaching of such events appertain not to the object of this work. They are written in red letters, a warning alike to rulers and to ruled.

It would not, narrowing our sphere of inquiry, be difficult to enumerate many examples where the ordinary phenomena of existing disease have been strangely modified in obedience to the involuntary operation of sympathy; as also where, without other assignable cause, certain affections have been developed in individuals who, though possessing a constitutional aptitude, had not, until this latent sympathy was aroused, displayed any particular morbid manifestations; and who, were it not for the kindling of the latent spark, might have gone through life without being conscious themselves, or manifesting to the world the existence, much less danger, of that mine of insanity thereby sprung. Physical sympathy we know to be proportionate to nervous communication or nervous supply, and to be, moreover, to a great degree dependent on the general tone of the physical constitution. With this, psychical sympathy or imitative propensity preserves an analogy, since observation establishes that it is most liable to be aroused in those whose physical structure bespeaks high-wrought sensitiveness, and whose psychical receptivity appears equally open to impressions from without. Man in a state of health has been aptly described as an imitative animal. In diseases of the nervous structures more particularly this natural disposition becomes morbidly increased, and many deeds which his unclouded judgment would reject become acts of necessity, against which all his struggles are in vain. This insane adoption of particular habits must be distinguished from that which

in the healthy mind results from continued association: the one proceeding from a morbid and determinate assimilation of conduct—the other denoting an insensible accordance of sentiment; the one implying the assumption of a particular habit irrespective of principles—the other the adoption of such habits from the acquiescence with their principles. There is, then, in the recognition of this physical and psychical action and reaction, a further element for the formation of diagnosis, which, it will appear, is equally valuable both in its application to the individual, as well as to the act under investigation: to the individual, as entailing the analysis of his nervous constitution—to the special character of the act; as leading the physician to estimate the relation it may bear to any circumstances, however remote, which experience assures him are adequate, through those sympathetic laws, for its development, if not its generation.

That extraordinary states of mental excitement may be, to a remarkable degree, dependent on some single physical nervous derangement adequate to present illusions to the predisposed mind, is particularly illustrated in hypochondriacal disease. In proof that the influence of local causes seems to be, in many cases, mainly instrumental in the production of psychical phenomena, we quote Esquirol's observation: "Reil relates that an insane lady having fits of excitement, and even of frenzy, her maid wishing one day to quiet her, put her hands over her eyes, when the patient immediately recovered herself, was perfectly calm, and declared that she no longer saw anything. The medical attendant, informed of this phenomenon, tried the experiment himself, and was convinced that her agitation was produced by the disorder of her eyes, which represented terrific objects to her."[45] Baron Larrey mentions the particulars of a patient recovering from amaurosis, to whom all objects appeared of unnatural magnitude. Many other similar instances are on record.

In our estimate of causes of such a nature, while admitting the fact of the local organic change rendering the nervous apparatus a defective or erroneous messenger, we are still led to investigate the condition of the mind, which is inadequate to correct erroneous impressions thereby received, and permits apparently trifling lesions to prove sufficient for the destruction of the balance of power, thereby shown to be in many

minds suspended by the feeblest threads. Yet as the least experienced will call to recollection ample facts to satisfy them that such local deviations from normal action are but secondary links in the chain of morbid phenomena, it is best to pass to those more particular, but not less practical, considerations which relate to the special character of the criminal acts.

The first form of this disease includes those cases in which the impulse exists, and the motor powers are *in initio* under control.

Medical writings abound with illustrations of this form of disease, of which M. Marc has in particular afforded many well-marked examples. The cases he has adduced have already been quoted by so many authorities, more particularly that which occurred in the family of M. le Baron Humboldt, that it is scarcely requisite to do more than now refer to them. A female servant, while daily undressing a little child, was at such times, from the whiteness of its skin, seized with the desire to tear it to pieces. Restraining her impulses, she threw herself at the feet of her mistress, against whom she had no complaint, and entreated that she might be sent out of the house. Another instance may be adduced from the same author. A young lady in an asylum, rational on every subject, experienced a violent inclination to commit homicide, for which she could not assign any motive. Whenever she felt the approach of the fit she entreated to have the strait waistcoat put on.[46] Dr. Zimmerman relates the case of a peasant, born at Krumback, who was often seized with an irresistible impulse to commit murder. He felt the attack coming on for hours; sometimes for a whole day. As soon as this presentiment of its approach was experienced, he begged to be secured and chained, that he might not commit some dreadful crime. "When the fit comes on," he says, "I feel under the necessity to kill, even were it a child." He declared that his parent, whom he loved tenderly, would be the first victim to this murderous propensity. "My mother," he cried out with a frightful voice, "save yourself or I must kill you." Before the fit he complains of being exceedingly sleepy, without being able to sleep. He feels depressed and experiences slight twitchings in the limbs; he preserved his consciousness during the fit, and was conscious that in committing murder he would be guilty of a most atrocious crime. When he is disabled from

doing injury he makes the most frightful contortions and grimaces, singing or talking in rhyme. The fits last from one to two days; when they are over he cries out: "Now unbind me. Alas! I have suffered cruelly, but I rejoice that I have killed nobody." [47]

Another example may be briefly quoted. A gentleman called by himself at a lunatic asylum and begged for admission, at the same time presenting a note from his solicitor, whom he had just left. This note confirmed his own account that he required restraint, for, as he stated, "he had an irresistible desire to murder his wife or one of his children." He continued: "That the preceding day he was walking in his garden, when he saw his wife and little girl approaching toward him. His eyes at the same moment caught the sight of a hatchet lying on the gravel walk, and he described that he had the greatest struggle within himself to escape out of the garden before he seized it, to strike, perhaps fatally, one or other of them." He loved his wife and child, he affirmed, dearly, but the homicidal idea haunted him continually, and he felt that he could not trust himself alone in their presence. It should be added that the last time he slept at home he did attempt, in the middle of the night, to strangle his wife, and would have succeeded had not her cries in the struggle brought in timely assistance. In the midst of all this, during the explanation he gave of his case, he expressed himself well and rationally. His intellect appeared to be unclouded, and it turned out that he was at the same time in communication with his solicitor respecting some proceedings in the Court of Chancery, upon which he gave perfectly sane instructions.[48]

The list of cases might be extended without difficulty. Sufficient has been adduced to establish the nature of this particular form of impulsive disease, the proximate cause of which appears to depend on any circumstance adequate to specially attract the predisposed mind, more particularly if such cause is of a nature capable of associating with the depraved intelligence the motor powers. Thus in one case the proximate cause rested in the object of homicidal intent; while in the other the predisposition had no fixed attraction. Again, the predisposition is directed toward the objects by which the general thoughts are chiefly occupied, its active exercise being dependent on incidental occurrences. In the last-mentioned

case the morbid predisposition was at once roused into action by the sight of a weapon capable of forming a link between the insane impulse and motor powers.

The period of life at which this impulse to destroy has been observed to occur, and the length of time during which it has been known to continue, afford additional evidence of its being a special form of disease. Esquirol relates the case of a young girl, eight years of age, who manifested a determination to kill her stepmother. In the case of John Glenadel the desire for murder existed for the space of twenty-six years. In all these cases a consciousness of wrong in the act and an incapacity for its avoidance were fully experienced.

The second form of the disease—that in which, simultaneous with the impulse, is the accordance of the motor power.

William Brown was executed at Maidstone, England, in 1812, for strangling a child whom he accidentally met one morning while walking in the country. On the trial he said he had never seen the child before, had no malice against it, and could assign no motive for the dreadful act. He took up the body and laid it down on some steps, and then went and told what he had done, requesting to be taken into custody. He bore an exemplary character, and had never been suspected of being insane.[49] A young man in perfect health awoke suddenly one night in a fit of raving madness, ill-treated his wife, attempted to leap out of the window, and struck at whatever came in his way. An emetic put an end to this scene in an hour, since which he has been in a perfect state of health, never having had a recurrence of the attack.[50] It is related of Mathews, the comedian, that having for some days led a vapid and inactive life, he joined a party of pleasure. "He had not ridden out of the city for some weeks, and was in a state of childish delight and excitement. At this moment his eyes turned upon one of the party, a very little man, who was perched on a very tall horse, and who seemed unusually grave and important. Mr. Mathews looked at him for a moment, and the next knocked him off with a smart blow, felling him to the ground. The whole party were struck with horror, but no one felt more shocked than he who had committed the outrage. He dismounted, picked up the little victim of his unaccountable freak, declared himself unable to give any motive for the action, but that it was an impulse he could not resist;

and afterward, in relating the extraordinary incident, he declared that it was done in a moment of frenzy, induced by the too sudden reaction from previous stagnation of all freedom and amusement."[51] Many examples of this nature might be adduced confirmatory of Esquirol's opinion that "there exists a species of homicidal madness in which no disorder of the intellect can be discovered." In the cases last mentioned, the previous history is only of negative value; the character of the acts alone affording grounds for our opinion. Were this disease to remain thus simple and uncomplicated, its diagnosis would present sufficient negative grounds to invest it with an almost positive certainty—the known character of the accused, the abstract atrocity of the act, the circumstances preceding its commission and following on its consummation, rendering its investigation a matter in which a careful estimate of natural laws is that chiefly required. Inasmuch, however, as actions closely identical with these impulsive movements may arise as the result of vicious conditions of mind, which accord in their character to morbid operations, their diagnosis is not infrequently involved in considerable difficulty.

In our considerations respecting moral insanity it was found in the form of disease manifested by a general derangement of the moral principle, there was a remarkable and close analogy between its operations and those of vice. The details of many cases prove that homicidal acts have resulted from mental conditions, in which the singular accordance of morbid phenomena with the ordinary operations of crime was well calculated to confound those who would attempt to form a judgment without instituting a most careful analysis. In an example related by Pinel, the habitual indulgence of evil passions was accompanied by a disregard of animal life, and such an uncontrollable career of vice as led to the commission of murder. Dr. Prichard has enumerated many cases in which homicidal and moral insanity were intimately associated. Thus: Antoine Leger, whose previous history established insanity, "seeing one day a little girl near the margin of the wood, he seized her, murdered her, sucked her blood, and afterward buried her body. He was, we regret for the sake of medical science, sentenced to death. MM. Esquirol and Gall examined his head. The former discovered morbid adhesions of the pia mater to the brain. M. Gorget, after examining

the facts, justly concluded an asylum, rather than a gibbet, should have been the sick man's award."[52] To this we may add the case of Feldtmann, "who, after attempting to gratify an incestuous passion for his own daughter, who had invoked the aid of the police to resist his attacks, stabbed her to the heart, wounded his wife and another daughter, and then gave himself up to a crowd who surrounded him, exclaiming, in reply to their reproaches, 'C'est bien fait.'" This unhappy being was also executed. The existence of insanity was not fully established by facts; but it seemed evident that the miserable wretch, who suffered for his offence, had scarcely intellect enough to comprehend its nature and to perceive the turpitude of his conduct, though he foresaw the destiny which awaited him. M. Breschet considered his brain to be in a condition different from that of health; and M. Gorget's opinion was that "Feldtmann was a man whose weak intellect was overwhelmed by a passion constituting in itself a real disease, which ought to have been cured by separating the unfortunate wretch from society, without resorting to the barbarous expedient of extinguishing it together with his life."[53] In the case of Anthony Emmanuel Joberd we find, superadded to perversion of the moral feelings, the homicidal mania, accompanied in one instance by the capability of control consequent on the contending force of passion; and the impulse yielded to in the second, where a perfect stranger, altogether indifferent to the accused, was the victim.[54]

We have deemed it the more advisable course to refer to well-known instances of this disease, rather than to adduce examples whose details, though less familiar, would still present no better illustration of the phenomena we seek to elucidate.

Cases of this nature constitute not infrequently occasion when the physician is called upon to affirm the godlike function of the healing art, which, for the tempering of justice with mercy, declares that the operations of disease, whether they render the body a disfigured mass of loathsome matter or pervert the mind till it becomes a depraved instrument for revolting conceptions, are still fitting objects for commiseration and care, rather than abhorrence or vengeance.

We have affirmed that simple and uncomplicated examples of disease offer to the experienced physician but little difficulty

in their recognition; the truth, however, is that uncomplicated lesions are the exceptional cases. It is for the estimate of morbid combinations that the medical mind becomes essential. Thus homicidal insanity or impulsive mania, associated with the desire to destroy life, may arise pending another and distinct form of disease, of which it is not impossible it forms the most prominent feature. The one affection becomes engrafted on the other, and the same mistake occurs as is common in physical disease—the symptoms which appertain to one are considered as characteristic of the other, and their differential diagnosis is thus lost sight of. It is not difficult, with the foreknowledge that an individual has suffered from unsoundness of mind, to estimate at its true value the homicidal act. It may be also an easy matter to recognize the process by which an admitted monomaniac has become a homicide; but cases occur in which, for such a purpose, every conceivable obstacle exists; in which the homicidal act has seemingly no connection with the delusion, as in the instance of the youth and the windmills; or again, where the monomaniacal condition is so concealed that the homicidal act, long contemplated and deliberately executed, is in itself the first prominent indication of the mental unsoundness. Thus a man of the name of Frost was tried for killing four children at Norwich; his idea was that he thereby obtained for them an early translation into heaven, and sent them all there.[55] Instances of this nature differ materially from the true form of the disease we are describing; for in such, strong motives for the deed, however insane, exist in the mind of the patient, against which they may have long struggled secretly, until at length, from the delusive nature of the morbid conception, they are led to regard the commission of the act, which they had previously abhorred, as the highest evidence of their moral excellence. In such examples impulse, it is true, exists; it is, however, a phenomenon engendered by, not originating with, a mental condition. We have alluded to the influence which psychical sympathy is capable of exercising on the masses, and have inferred that this form of insanity presents a remarkable analogy to other diseases involving the nervous system. On this point Winslow writes: "The commission of a great and extraordinary crime produces not infrequently the mania of imitation in the district in which it has happened.

A criminal was executed at Paris not many years ago for murder. A few weeks after another murder was perpetrated; and when the young man was asked to assign a reason for taking away the life of a fellow-creature, he replied that he was not instigated by any feeling of malice, but after having witnessed the execution, he felt a desire, over which he had no control, to commit a similar crime, and he had no rest until he had satisfied his feelings." Gall has recorded the instance of a man who, on reading in the newspapers the particulars of a case of murder perpetrated under circumstances of peculiar atrocity, was instantly seized with a desire to murder his servant, and would have done so had he not given his intended victim timely warning to escape.

In those individuals in whom a latent predisposition to this disease exists, extraordinary mental emotions are known to be capable of acting as the proximate cause of its development. Pinel relates a case of impulsive insanity consequent on the excitement of seeing armed men. Similar examples might be quoted, as also other instances, in which, when so excited, the mere sight of a fitting weapon has been sufficient to determine the execution of the extreme act. It would be a matter of mere industry to extend the number of such illustrations; we forbear to do so, believing that if those we have advanced prove insufficient, others would not render us more certain.

In the investigation of cases of this nature the physician requires to stand fast by the principles of philosophic medicine, that he be enabled, as far as human means avail, to aid justice by, on the one hand, protecting the victim of popular hatred; or, on the other, exposing the pretender who should seek to screen his infamy under the mask of infirmity. Who, on reading of the execution of many of those wretched insane, but feels thankful that we now live in an age when science, dissipating the gloom of ignorance and superstition, has divested psychology of other difficulties than those which are inseparable from all sickness, as being involved in the great mystery of our being?

Here it is that the psychologist requires to concentrate the several elements which contribute toward his diagnosis. All that relates to the personality of the accused; the estimate of his mental constitution, both in its moral and intellectual

operation; the character of the act in its twofold relations to his intelligence—constitute the three sources in which the grounds of his opinion rest. We impress the necessity of carefully estimating the psychical as well as ethical relations of the act. While the law recognizes the act, it is still determined by the motives which may have induced its commission. Such being the case, the presence or absence of presumed motives to the crime becomes of the greatest importance—the existence of these motives being determined by the evidence, their psychical value resting with the physician. We impress this latter point, for were the truths of medical science to be regarded as being dependent on the imperfect machinery of the law, we should have the appreciation of each act varying not only according to the number of motives wanting or adduced, but also proportionately to the significance of those motives in the mind of the separate members of a jury. It is well that the sources of error, as regards motives, be fully understood. In one instance the presumed absence of motives may proceed from our inability to detect them; while in another, the only motives adduced are of a character altogether disproportionate to the magnitude of the crime. Thus, in the year 1826, a young girl was condemned for life to the public works for having in cold blood cut off the head of a child belonging to one of her neighbors. In the absence, says the "Gazette des Tribunaux," of all known interest in the commission of the crime, the medical men declared that the mental condition of the accused presented unequivocal symptoms of mental alienation. The real facts were revenge for the father of the child having deceived her in love.[56] The record of crimes in England affords similar illustrations. In July, 1837, a man of the name of Greensmith was tried for the murder of four of his young children. He was proved to have been a man of industrious habits; he got into distress and destroyed his children to prevent them being turned into the street; there were no other motives. He was found guilty and was subsequently declared to be insane.[57] Here, in one instance, we have motives concealed; in the other, motives indicative of insanity.

How many men may, with the greatest deliberation, commit crime, but, owing to circumstances, be mistaken in their victim, and a homicide be perpetrated where no motives

having reference to the individual suffering can be detected. Again, the existence of motives, however reasonable those motives may appear, is no proof of the sanity of the accused, since they may have as their origin data which, however apparently reasonable, are still the offspring of a perverted intelligence. In the case of Feldtmann, the homicidal act proceeded from an inability to gratify a criminal passion, which passion, it was evident, was the result of disease. Again, how many motives, according to the evil dictates of our nature, such as jealousy, hatred, or revenge, known to be cherished against a certain individual, may, in the event of his death, be adduced in proof of prearrangement as well as of premeditation, and those feelings have their origin in true data operating on a monomaniacal mind, as we had illustrated in the case of Ovenston. They, then, who would affirm that an individual is responsible for his acts, unless they have been the result of "motiveless impulse," must confine the number of insane within a very narrow limit, and ignore the truths of those verdicts which in many of the most important cases have been recorded.

It follows from these considerations that, though the apparently wanton atrocity of an act cannot be rejected in our estimate of its source, yet it is in itself no proof that its perpetrator was insane. The suddenness of an act is no argument against its matured premeditation. The presence or absence of motives cannot be regarded as of other value than such as they derive from their association with the mind of the accused, rather than the circumstances under which the criminal act was accomplished.

We believe that there are conditions of the system in which morbid impulses exist, inexplicable by any of the ordinarily recognized psycho-physical conditions. How many individuals to all appearances enjoying physical and mental health, of whose many amiable and excellent qualities no doubt could be entertained, have, notwithstanding their apparently healthy state, acted in such a manner as not only outraged those laws necessary for the welfare and preservation of society, but also with the full consciousness of the impropriety of their conduct, committed some act so diametrically opposed to the previous current of their lives, so perfectly at variance with every probable motive or conceivable advantage, so trivial in its

inducements, and yet so lamentable in its results, that common sense rejects the idea of rationality in its consummation. That under such circumstances criminal acts are perpetrated, when the free agency of the individual is for the purpose of their commission suspended, is undoubtedly true. We admit the accused, as far as the possession of intellectual powers go, to evidence the ordinary exercises of a cultivated mind, and, as far as the moral faculties are concerned, to be perfectly alive to the best and tenderest duties which strengthen the ties of social life; and yet, occasion offering, a sudden yielding of the justly-balanced mind occurs, whereby the object of our sympathies becomes placed in a position strangely analogous to, yet widely—very widely—differing from the operations of vice. The solution of this psychical problem may be presumed to rest in an investigation of the laws of psycho-physical sympathy: more particularly as the examples illustrative of the phenomena to which we refer are to be met with more frequently in females, usually of susceptible nervous systems and sensitively-constituted minds. That there are times in which the female sympathies are keenly alive to external impressions and the mind in a condition of morbid receptivity, those intimate with feminine diseases must be fully conscious of—a condition presenting a strange compound of physical and mental hysteria, this condition chiefly manifesting itself at that period of life when nature, undetermined respecting the perfection of her processes, disarranges the harmony essential for self-control, without at the same time manifesting any special indication referable in a sufficiently marked manner to either the physical or mental constitution. At such periods, strange physical sensations are experienced, and morbid desires flit across the mind without sensibly interfering with its just and proper exercises. Pending this recurrent psychopathical condition, the psychical and physical sympathies become so completely interwoven that they immediately respond to the suggestions one from the other, when, unless restrained by a principle of action capable of resisting their reciprocal and combined influence, the individual becomes committed to some act of egregious folly, it may be, bearing all the similitude of crime. In the individual enjoying perfect health there are instances in which analogous feelings are experienced, when circumstances engender the predisposition,

and a proximate cause for its development almost coincidently occurs. How many have from being placed in an elevated and unguarded position, when the physical influence of the atmosphere and the psychical influence of the ideas react on each other, experienced such a revulsion of the feeling of self-preservation as urged them to commit a suicidal act, to which their unclouded consciousness, morale, and natural inclinations were opposed! We believe that in the condition of the female system alluded to, acts are perpetrated as little according to the healthy, free, and deliberate exercises of the individual, and for which they should be considered as equally irresponsible; in which previous to their commission, to all appearance, perfect physical and mental health existed; and subsequent to which a full consciousness and all the bitterness appertaining to the commission of the act are experienced. Yet in cases of this nature, at such a moment, the individual was, for the time, altogether irresponsible; being irresistibly urged to the commission of the act to which the mind was morbidly attracted, and for which the motor powers simultaneously yielded. The case of Charles Mathews in a measure illustrates this phenomenon, as witnessed in the male, while in the female many of those otherwise inexplicable examples of so-called crime which occur in the persons of honest, unexceptionable characters are to be similarly classed.

A form of disease already considered, kleptomania, however connected with physical indisposition, may be first evidenced by derangement of the moral faculty, rendering it subservient to morbid impulse, the integrity of the moral principle seeming to be intact, except as far as may be inferred from the impulsive act. It is also to be distinguished from monomania, inasmuch as the intelligence, when aroused to its consideration, comprehends the full and true relation its commission involves. We are led to form this opinion chiefly from the known character of many who have, from such impulse, been committed to apparently criminal acts. While recognizing the principle which should guide the diagnosis of such cases, we are, at the same time, fully conscious of the almost interminable difficulties besieging its application. We believe, however, that as the reciprocal sympathies of mind and body are more closely studied, a clearer conception of this condition will be established, and phenomena but imperfectly understood be more fully appreciated.

We have mentioned the necessity of a principle of action as necessary for self-restraint. From this two questions arise:

1st. To what is this principle of action to be referred?

2d. What are the conditions essential for its operation?

The answer to the first inquiry happily rests with every individual. The well-regulated mind may be said, in the ordinary affairs of life, to act aright instinctively, not from any premeditation that a particular line of conduct is right, but because any other line of conduct would at once become the occasion of mental pain. Self-examination assuring us that this principle of action is fixed in the consciousness of each, we are led to the conclusion that it cannot depend on the mere suggestions of the intelligence, nor yet result from the abstract operation of the emotive faculty, for the harmonious coadaptation of each of these is essential for its due exercise. This principle of action is a pervading power which rests in and yet is not of the mind. Education and religion can but develop and direct; they cannot create it: its existence being neither dependent on the operations of the one nor capable of being replaced by the offices of the other, since without it the mind would be but an instrument for superior animal pleasure, and religion a motiveless exercise of what should therefore be regarded as senseless observances. Its light may be obscured; it cannot be quenched. Its course may be perverted; it cannot be stayed so long as intellectuality appertains to man. Piety, truth, love, and justice are its growth; rational self-love being as nothing in its estimate, individual enjoyment but the least of its results. It is in truth that *divinæ particula auræ* which, reflecting on the creature brightness from another sphere, raises him above the conflicting interests, miserable jealousies, and many petty inducements to crime, besetting on all sides his journey through a changeable community and a changing world.

The condition essential for the operation of this principle is psychopathic freedom of mind. We use the term psychopathic as contradistinguished from metaphysical freedom on the one hand, or that condition in which vice, with the skilful sophistry of guilt, exercises its pernicious influence on the other. In the character of cases to which we have so imperfectly alluded, this psychopathic freedom is for the time suspended; the regulating principle being placed in abeyance;

the act denoting but the mechanical expression of a passing morbid condition.

It may be urged that the object of the law is to so correct the mind of the offender by punishment, and to so confirm the principles of the community by example, that while the depraved may be reformed the weak may be strengthened, and thereby this principle of action be maintained in its fullest integrity. Admit all this. Even allow that the recognition of an irresistible impulse, previous and subsequent to which full rationality is affirmed to exist, offers an easy explanation for any crime, and yet one cannot deny that cases of this nature have occurred and may occur again. Law in their adjudication when disease is established becomes divested of its severity; since justice restrains its exercise to their preservation from injuring the community, and to the personal safety of the individual, in whom such a manifestation must be regarded as being at least indicative of a psycho-physical condition requiring anxious and close attention.

The question of punishment is merged in that of volition and health. If disease, as contradistinguished from vice, be present; if insanity, the result of abnormal psycho-physical action, as distinguished from that unsoundness of mind and depravity of morals which are characteristic of the operation of sin and crime, be allowed to exist, we confess our inability to propound any rules by which the creature could be thus constituted the avenger of his Creator; or, allowing the doctrine involved in such a practice to be correct, we know not any means that should determine with certainty the extent of such morbid operations, and thereby assign a limit to our endless conjectures. Sooner, to use the words of Ideler, "could we see upon the disturbed waters the clear image of what surrounds us, more easily calculate the status of every wave, than find in the ebb and flow of such thoughts the mirror of our relation to nature or the law of our changing emotions."

The close association which seems to exist between suicidal and homicidal mania has attracted the attention of most writers, who attribute them both to a morbid perversion of the natural instincts; the same causes which originate one being adequate to the production of the other. The Monument in London, the Place Vendôme in Paris, have furnished many

examples in proof of this assertion. Though the act of self-destruction be opposed to the first principles of our nature, yet we incline to the opinion that in every instance the commission of suicide cannot be regarded as a proof of insanity; since it may but argue the acme, or last desperate effort of vice in one who, knowing that the just rewards of his evil deeds await him, in recklessness of his life, by a final resolve attempts to anticipate the operation of the law. Such an act we do not believe is a whit more indicative of insanity than that dogged indifference to final judgment and public execration witnessed in the conduct of many of the worst criminals, whose last ambition seems to be that their equally reckless companions among the motley crowd may witness their "dying game." We cannot, therefore, in all cases, infer the animus which led to the homicide, from the mere fact of the subsequent suicidal attempt, be it successful or otherwise.

The diagnosis of this particular operation of disease, in its simple and uncomplicated form, rests chiefly on negative rather than positive grounds; and may be derived from events preceding, pending, or subsequent to the commission of the deed. In contrasting homicide the result of disease with homicide the result of vice—though they may have many features in common; though the nature of the acts be identical, and the means adopted for their perpetration the same—we still have abundant proof to satisfy us that—

> "Murder, though it hath no tongue,
> Will speak with most miraculous organ;"

since each day declares that the mysterious working of Providence guides the retributive justice of man and enables him, by a chain of circumstances, to arrive at truth; though craft, and subtilty, and the deep resolves of human intelligence have been strained to the uttermost for its concealment.

Following in the steps of other writers, we may thus particularize some of the principal differences between the criminal and insane impulse:

a. The criminal premeditates his plan, and, of necessity, selects his victim. The impulse has no premeditation, and has not, of necessity, a selection.

b. The criminal act is the consummation of previous criminal desire. The impulsive inclination either originates with the act or is unassociated with the object of it.

c. The criminal act is generally complicated. The simple impulsive movement never is so.

d. The criminal conceals the deed he purposes to commit, and after its perpetration endeavors to escape its consequences. The impulsive action is acknowledged and deplored; while, subsequent to its commission, its detection is not avoided.

e. The criminal, if he has not accomplices, has at least vicious associates and explicable motives. The impulsively deranged never has accomplices, is without rational motives, and may, in his social relations, be unexceptionable.

f. The criminal usually selects victims against whom hostile feelings exist. The impulsive acts without discrimination, and not infrequently violates all natural affections.

g. The criminal carries his evil practices no further than the gratification of his evil passions in the commission of the act may demand. The accomplishment of the impulsive act by no means removes the impulse or satisfies the morbid propensity.

In our considerations respecting the varied forms which monomania may assume, as also in our analysis of unsoundness of mind, chiefly evidenced through derangement of the moral faculties, we have perceived that the supervention of a homicidal impulse may, in many cases, constitute but the climax of pre-existing symptoms. The most we can, therefore, attempt is to state what those general rules are which may guide us in our opinions, and enable us to recognize the various forms in which impulsive insanity is known to occur—when, by the careful and minute investigations of all pre-existing, coincident, and subsequent facts, we may at least find the nearest approximation to truth.

We venture on the following conclusions as being of importance for such an end:

I. Impulsive insanity exists as a special form of disease in its manifestations uncomplicated by other phenomena.

II. The patient may be fully cognizant of the civil and ethical relations of the particular act from the perpetration of which he is unable to desist.

III. In one class of cases the impulse may be successfully controlled, and a considerable period intervene between the origin of the impulse and the commission of the offence.

IV. In a second class of cases the commission of the offence is coincident with the origin of the impulse.

V. In both these cases the previous history may fail to account for the morbid phenomena.

VI. The diagnosis of this affection may be stated to rest in the positive nature of the crime and the negative character of the symptoms.

VII. Though pathology fails to establish fixed psychopathic relations for this form of mental unsoundness, yet the existence of every lesion of the nervous structure becomes an important element in diagnosis.

VIII. Observation affirms that psychical sympathy, or imitative propensity, is one of the most frequent of its exciting causes.

IX. Where the predisposition has been established, the immediate or proximate cause of its development may rest in any object capable of exciting undue emotions, more especially if such excitement accords to the predisposition.

X. This predisposition may exist without manifesting such signs as would lead to its detection, previous to the commission of the homicidal act.

XI. The proximate cause of the homicidal impulse has, of necessity, no further relation to the homicidal act.

XII. When the homicidal impulse arises, pending other forms of mental disease, its existence is to be regarded as a symptom of such disease, and to be explained accordingly.

XIII. That under such circumstances the special characteristics of this homicidal impulsive affection are lost in those which appertain to that form of insanity with which it may be conjoined.

CHAPTER V.

We have endeavored to show the nature of many difficulties investing the questions under our consideration, and for the appreciation of mental diseases have impressed the necessity of closely scrutinizing, through a careful system of analysis, the psychical and physical relations. It does not, however, follow, because experience has declared this to be the best, if not the only reliable plan by which to arrive at truth, that it will, therefore, always prove adequate for guidance to such an attainment, since cases not infrequently occur so strangely anomalous in their character that medical men of great experience differ widely in their opinions respecting them. Shallow reasoners have thence presumed to argue the incapacity of psychopathic science rather than to acknowledge its difficulty or obscurity. We are free to allow the latter, and, in consequence, to admit the necessity for the recognition of certain principles which may confine, as far as possible, the solution of scientific problems within the range of scientific certainty, and so, in a measure, render them independent of individual opinion, the value of which is proportionate to the capability and opportunity for its formation.

Observations in the abstract sciences lead us to refer corresponding results to identical causes; experimental philosophy enabling the analyst to so arrange the elements under consideration that their properties and relations may be rendered matters of demonstration. Every established fact is thereby constituted an available and known power, which inductive reasoning may, with confidence, employ in the solution of future phenomena. It is different when we come to apply the same principle for the establishment or appreciation of phenomena whose source is beyond our reach; for being unable to control or define the order and succession of their arrangements or combinations, we are soon convinced that each new appearance must be regarded as but a result of a varia-

ble power, from which, however justly we might otherwise reason, we should, consequent on the absence of positive data, be unable to predicate a necessarily accurate conclusion. In the prognosis of disease this is especially verified, the nearest approximation to truth in our opinion being, not that which is easily explicable by theory, but which is most in accordance with experience. This possible uncertainty in the prognosis of disease must be distinguished from an incapacity for the due appreciation of its nature. The former involves a question of experience in the progress of vital actions; the latter, the capability of appreciating physical media for the exposition of these actions. The one anticipates the future—what may be: the other refers to the past—what has been or is. The difficulty of the former rests, not so much in determining what are the constant, but in calculating what may be the accidental, concomitants of any particular phenomena: the obscurity of the latter seems to be dependent, not on the estimate of material changes, but their pervading immaterial agency beyond our reach. Notwithstanding such obscurity, there can be no greater error than the supposition that because the study of medicine involves the estimate of inaccessible momenta from their accessible results, its practice should be regarded as speculative, or other than an inductive science; since the close observation and careful appreciation of those laws by which physical actions and psycho-physical relations appear to be governed have so supplied the process of experiment that, though vital agencies are intangible, we are enabled to estimate with an approximate, if not a mechanical certainty, for all practical purposes sufficient, the value of their manifestations; while, in our appreciation of cases for which no analogy exists, we must bear in mind that while experiment deals with matter, observation is the analytical agent by which the form and quality of mental disease is estimated.

That we may not involve familiar truths in any unnecessary intricacy of argument, we shall regard certain facts as self-evident propositions, and allow the psychical and physical constitution to vary in each individual. As our knowledge of mind and matter is merely relative, it becomes essential that, for the appreciation of undetermined phenomena, we recognize a standard for comparison which, notwithstanding

the endless diversity of their several relations, may be equally available for all and appreciable in each. This standard we possess in that condition known as health, which physically implies the normal exercise of the several organs in their mutual relations for the maintenance of the body; and psychically, premises a capability of these organs perfecting such functions as are involved in the expression of the mind. We know not wherein the principle of vitality, as manifest through the physical structures, rests: we perceive the integral constitution and relation of the several elements of these structures to be transmuted and impaired in every conceivable manner, and yet life, though pursuing an erratic course, to still pervade and influence the whole. The constitution becomes, as it were, "broken up," indefinable disease being present. For the diagnosis of such conditions, physical changes may prove inadequate, as being not infrequently latent. We infer, however, that they are invariably present, because we do not believe that such a phenomenon as a purely functional disease exists; its assumption would open the path to endless absurdities in medicine, as leading to the recognition of immaterialism on the one hand, or inutility of organism on the other: both of which propositions are opposed to observation and at variance with admitted experience. It is right, therefore, we be satisfied that the true medical interpretation of the term "functional disorder" is disease whose physical manifestations are masked, but whose operations are evidenced. Allowing morbid changes of such a nature to be present, we ask—Are we enabled to speak with confidence respecting their limit, or to define how far they render an organism dependent on the adjuvant powers of other viscera? Though observation and experience lead to the inference that life may not be materially shortened through the presence of certain visceral irregularities, what physician would therefore regard them as of little consequence—mere matters of inconvenience? It is too frequently witnessed that which has been termed "functional disease" is only the appreciable manifestation of some destructive process, whose presence is thereby proclaimed. The records of the pathological societies leave no doubt on this point. While admitting such, we are glad, for the honor of medicine, to declare its rarity. Bearing these facts in recollection, how far are they applicable to the diagnosis of dis-

ease which can only be appreciated through its psychical operations?

The foundation of just psychology rests on the admission that without freedom of mind there can be no freedom of conduct. Mental freedom, as psychically interpreted, implies a normal condition of that organism through which mental influences are expressed. Were we to admit the possibility of the mind, as an independent essence, being diseased, folly, sickness, and sin should be identified: happily for ourselves, observation, reason, and revelation reject such a supposition. Were we to regard the mind as but the aggregation of functions, each possessing an independent existence, and disregarding the dictum of Lord Brougham, thereby admit, in the abstract, the possibility of a partial disease; before we could, in practice, estimate the extent of its influence, it would be necessary to determine the mutual reactions which the several functions are adequate to exercise, and define the degree in which the integrity of one power was capable of supplying or counteracting the influence of another; as also the relation any special deficiency bore to the whole. We possess no means of doing so except through the study of the individual character whose sanity may be under consideration. The problem is one which in recent decisions has found a satisfactory judicial solution. Viewing the cerebral structure simply as the organ for mental expression, we reason from effects to causes, and infer the imperfection of the instrument, from its defective operations; again, arguing from causes to effects, we declare the mind to be unsound because of the material incapacity for the healthy expression of those several elements, functional or otherwise, whose perfection is essential for its normal action. This may appear to be affirmation without proof, an argument in a circle, as inferring that because a man is deranged, his nervous apparatus is diseased; or because his nervous apparatus is diseased, a man is deranged. We are met with the fact that cases are on record apparently subversive of both propositions. Physicians, however, do not contend for their capability of solving every mystery in disease, but they are confident that their knowledge and experience render them the most competent for such a purpose. If then physicians regard insanity as the expression of morbid changes, can they define its extent, fix the range of its influ-

ence, or with certainty affirm the ratio which those mental agencies they admit to be at fault bear to the general expression of the whole? especially keeping in mind that though an error in the diagnosis of physical derangements can, through many agencies, be rectified, an error in this particular instance may blight fortune, ruin character, or consign to death.

Taking a different view, and allowing an independent, indivisible existence and action of mind, we are brought to investigate the extent of mental unsoundness which may in any case be present: What criteria for judgment do we possess? The definite expression of the indefinite power proves nothing of the mental condition beyond its particular manifestation, while it is the value of that manifestation we are required to determine from its relation to the unknown power. Whichever view we adopt, the admission of unsoundness of mind, as distinguished from natural incapacity, or ignorant incompetency, that is insanity in its full signification, must, in its individual relation to law for the purposes of justice, be regarded as entailing, *ex necessitate rei*, irresponsibility, while in its relation to the community, for the maintenance of the public safety, it becomes requisite that society be protected from the danger which might result, were those so affected permitted to continue unrestrained. The spirit of natural equity and every logical argument are opposed to any other principle whose adoption has already been urged by the ablest pens. We cannot, in addition to what we have stated, refrain from expressing our belief that more danger has resulted to mankind from the recognition of the doctrine of partial insanity and partial responsibility, leading to the confounding of wickedness and crime with disease, than those who propound such doctrines would be disposed to admit. Thence have arisen so many ridiculous and untenable opinions, unsound and illogical propositions, unsafe and dangerous precedents. A regards motive as sufficient test; B requires knowledge of morality or immorality of act; C demands a comprehension of its relations to the law; D argues from the presence or absence of self-restraint; E considers the existence of delusion essential; F associates delusion with act; G rejects the mental unless corroborated by the physical condition; H commingles insanity with crime; and all contribute somewhat to involve the question in almost inextricable perplexity. We might extend this

list: to do so would be merely to repeat what we have already propounded.

There is one doctrine we have reserved for special comment —that which would regard a culprit's accountability as "a perfectly distinct subject of inquiry from his mental condition;"[58] thereby rejecting the only elements for the formation of an opinion, since the accountability must rest in the mental condition. The author of this proposition thus writes: "But here comes the practical difficulty in the way of the settlement of this question. If we admit that lunatics, affected with partial insanity, may be, under certain circumstances, responsible for their actions, and under certain other circumstances not responsible, how are we to decide when they are to be exempted from punishment and when not? And further, supposing that they are, under any circumstances, fit objects of punishment: how is that punishment to be regulated to their offence, and when is it to be administered?"[59] The answer to the first of these questions is propounded in the proposition laid down by Lord Erskine in his defence of Hadfield—the relation of delusion and crime. This, however, often replaces one difficulty by another of equal, if not greater, magnitude. We speak of obscure cases. We further read: "As to the second question, namely, the propriety of making lunatics, under any circumstances (even when proved to be sufficiently rational to be capable of self-restraint), amenable to punishment, I think that every one will agree with me in concluding that so long as such a malady as this exists, no individual ought to be regarded as a fit subject for punishment, and, least of all, ought he to be sent to an ordinary prison to undergo the penalty of his misdeeds. The plain and obvious duty in all such cases is to forward him to a proper asylum, to have his malady skilfully treated; and, until this is done, nothing else ought to be thought of. But if, owing to the use of measures proper for his recovery, he is, after a time, restored to health, it may then be a question whether he is not properly punishable for crimes wantonly committed in his insane condition, though unconnected with it. In no other way, I conceive, can punishment be brought to bear on the insane."[60] This startling proposition is referred to that tribunal which "has been in use in these countries from time immemorial, and which has justly been regarded as the great bulwark of our lives and

liberties." We read: "The two questions they—the jury—would have to decide in every trial of this nature would be, first, is the individual really insane, and if so, what is the nature and extent of that insanity? and, secondly, had that insanity any direct influence in leading him to the perpetration of the crime with which he is charged?" In other words, the complete problem remains to be solved. We have expressed ourselves so fully on this point that we shall rest satisfied with inquiring, May not self-restraint be the strongest argument in favor of irrationality, as showing the predominance of some fixed, insane, latent purpose, which places all other feelings in a state of subserviency? While the malady exists and the patient is regarded as being inadequate to appreciate the corrective effects of punishment, why should he, when his reason is restored, be held accountable for those acts which its perversion resulted in, and from which he was at the time, in virtue of such a perversion, absolved? Is he not thus declared to be responsible as regards the effects, while he is considered irresponsible as regards the causes? It is true that justice is not to overtake him "until after a time" to be spent in "skilful treatment." To what length may this time extend? whether for a day, a week, a month, or year? Truly, when reading such propositions, we may well exclaim with the venerable Vogel that "great powers of reason are requisite to understand men destitute of reason."

"The execution of an offender," writes Sir Edward Coke, "is for example; the execution of a madman would be a miserable spectacle, and one of extreme inhumanity and cruelty." This most learned judge proceeds to state "a man *non compos*, as to his life the law of England is that he shall not lose his life for felony or murder, because the punishment of a felon is so grievous. To lose his life in such odious manner for he shall be hanged between heaven and earth as unworthy of both, and other penalties '*ut pena ad paucos; metus ad omnes*,' but the punishment of a man who is deprived of reason and understanding cannot be an example to others." There are, notwithstanding this and similar declarations on the part of others equally eminent, many who contend that the most effectual prohibition of crime rests in the public punishment of all offenders; affirming as their reason that the mind adequate to perfect the commission of any vicious act

should be held responsible for its consequences. They who argue in such a manner respecting those within the dictum of Sir Edward Coke, have but a limited conception of the operation of the disease, and take a narrow and one-sided view of the questions of public safety, as well as of criminal reform; while as regards the commission of the act, they confound the persistency of madness with the consistency of sense, and shut their eyes to the fact that it is not the mere act, but its psychical association, which constitutes the crime. The object of punishment according to Sir Edward Coke being twofold—reform and example—punishment inflicted on an individual for acts accomplished during his insanity must be wanting in its chief design—the reformation of that mental condition from which such act had resulted: inasmuch as reformation implies a full recognition of the varied relations of the act, which recognition, the presence of the insanity inducing to its commission is altogether opposed to. Considered in its relation to the law, for the purposes of example, in the execution of the insane, we, at best, but vindicate a civil enactment, directly opposed to those natural instincts which constitute for each one a code of innate jurisprudence of which our sympathies are the best conservators: and in doing so, disregard principles, the chief support of those laws whose vindication is sought in their violation. It is true that some crimes are so heinous in their nature, and so serious in their results, that the means best calculated to prevent their repetition become questions of the first national importance. The execution of the insane offender is urged, as a matter of public utility, by many who contend that for the regulation of society utility alone should be the criterion of right and wrong, and ought, therefore, to be the object of the legislature. This is an argument as false in its principle as it is dangerous in its application. The moment general utility trenches on individual justice, public safety becomes thereby impaired, and the way opened to endless encroachments; since what, under such circumstances, is the general welfare but the aggregate representative of personal interests? We contend, on the principles of truth and equity, not through feelings of pity or fear, that he who raises his voice to-day and demands that the insane offender be sacrificed to popular clamor—we will not insult common sense by calling it justice—to-morrow may himself be stricken, and re-

quired to expiate, not his crime, but his sickness, at that shrine his erroneous philanthropy has labored to erect. Let medical men rather devote their energies to the study of insanity as a disease, contradistinguishing it from that unsound or deficient mental regulation which vice engenders and evil passions direct; let them regard disease as a matter for cure, crime as an object for correction, and we are satisfied that there will be far less of that vagueness which baffles justice by misleading juries, and humiliates medical science in reducing it to a study of probabilities, without a rule to guide or a boundary to limit.

It is true that with insanity the worst criminal disposition may be conjoined; that "intriguing, unruly, vicious madmen" are to be met with, who, reasoning within their insanity, knowing that they are accounted insane, presume on their immunity from punishment, and, therefore, freely pursue their wicked propensities. A criminal disposition appears to be associated with, rather than to result from, a particular mental condition. In the question of their restraint is involved that of their correction, which should be regarded as implying the recognition of their amenability to treatment, rather than their responsibility for conduct, and is, perhaps, one of the strongest arguments which—whether justly or unjustly it is not our present object to discuss—has been advanced for the establishment of special institutions, to which the insane with such exaggerated criminal dispositions might be committed. Dr. Bucknill, in a work replete with practical suggestions,[61] has well distinguished "those who have become insane from the long indulgence of criminal propensities, from those who have become criminal for want of timely protection during their insanity; those in whom some degree of imbecility render a vicious character still more intractable, from those who have done wrong conscientiously believing it to be right; those accused of some slight offence for which they have never been tried, from those convicted of heinous offences, and after conviction becoming insane." A close analysis of the several degrees in which insanity and crime are related, as well as of the association observable between vice and disease, are adduced by Dr. Bucknill as arguments for a separate asylum for "lunatics of criminal dispositions," or the establishment of "a place of treatment distinct from the asylum and the prison,

and partaking of the characteristics of both; with more variety, leniency, and indulgence than are to be found in the latter; with a stricter discipline and a compulsory industry unsuited to the former." The basis of such an institution would be the recognition of insanity rather than crime, as distinguished from ordinary prisons in which crime rather than insanity is to be treated. This amenability, which has reference to insanity, is essentially different from that responsibility which applies to the sound in mind. In the one we recognize disease, and its accidental or incidental accompaniment, requiring painful and severe remedies, whose object is the correction of certain influences, through the application of means which experience proves are adequate to such an end—their use to cease when the design for which they had been instituted is accomplished. In the other, we punish the deliberate indulgence in crime with such pains and penalties as society may deem commensurate for the purposes of example as well as reform. The one is a matter of psychopathic treatment—the other a question of judicial and legislative policy. The one should never pass the bounds of daily observation and curative reasoning—the other may at once fulfil the requirements of society by the forfeiture of liberty, the continuance and perpetuation of physical correction, or, it may be, the deprivation of life.

The practical recognition of this principle opens a wide field for inquiry, wherein the questions of restraint on the one hand and correction on the other are brought into association. Its application can only have reference to the treatment of those who have been admitted into institutions as being insane rather than criminal, since it is the estimation of the individual's conduct in reference to his insanity, not in reference to the law, which should guide the employment of any means determined on. The inquiry thus merges into one of restraint and discipline, in a possible but rare case; for where sense of responsibility sufficient to appreciate the moral influence of correction is present, it is but reasonable to believe that such a condition of mind argues a capability for self-regulation, demanding that the prerogative of constitutional justice should be exercised for the benefit of the community and the diminution of crime; in other words, that law should prevail; while where the sense of moral obligation and capability for

intellectual guidance are so equally impaired that the employment of such means should prove merely productive of mental or physical suffering, it would be cruel and unjust to hold disease as criminal. Rewards and indulgences are known to exercise the most beneficial influences on the guidance of the insane mind; there are, so far, grounds for the inference that prohibitions and restrictions would prove equally beneficial in the reformation of their vicious dispositions, for there is no greater error than the supposition that the insane are insensible to those agencies which in the ordinary affairs of life influence the conduct of men. It is far from our wish to constitute the physician the judge, but we have no doubt that in the criminal jurisdiction of the country many important changes will yet be perfected which the psychical estimate of crime, in its intellectual and moral relations, shall dictate. Even now the good work is in progress. The object of our prisons being as much for reform as reproof, they have, in a great measure, ceased to be so many centres where, under the old system, the young found encouragement in evil for their future career, and the aged were strengthened in their crime. In the medical direction of those compound cases it becomes evident that "it is a point of great difficulty, in fact almost an impossibility, to detect the line of demarcation between responsibility and irresponsibility, or where one commences or the other terminates."[62] We cannot, therefore, do more than, while admitting the principles which should guide, acknowledge the obscurity enveloping their individual application, and as far as is possible forbear from confounding disease with crime, or shielding iniquity from those obligations which the general interests of the community demand should be maintained inviolate.

In regarding insanity as a disease demonstrative of an abnormal condition of the cerebral structure for psychical action, we are led to institute a further analogy between its manifestations and those which indicate other lesions of the nervous system. We know that a special peculiarity of such affections is their subserviency to the laws of periodicity. The two common affections of epilepsy and hysteria may be quoted as illustrative of the latent persistency and accumulative tendency, as well as profound obscurity, by which neurotic diseases are characterized. It is a matter of experience that

among individuals in whom the predisposition for those diseases has been established, causes which, under ordinary circumstances, would avail nothing, prove adequate to arouse the predisposition, and are capable of developing that morbid impetus resting beneath the surface of what, to common observation, would appear to be ordinary physical health. Examination of a patient between the periods of attack may afford little evidence of the mischief at work: a cause capable of acting on the predisposition occurs, the impetus is aroused, and the acme of the disease results; a period of repose follows, in which it would be folly to presume, because no active operations were manifest, that their source was not the less truly present. Curative measures may triumph over such conditions, and health follow on the exertions of the physician. The progress of analogous diseases, manifest through mental affections, is even more subtle. Insanity becomes developed, its symptoms subside, apparent rationality is present; a recurrence of the disturbance follows, again to be succeeded by a calm: curative measures accomplish their end, and the calm becomes perpetuated. A question thence arises—Are physicians, pending the abeyance of morbid manifestations, warranted in affirming the presence of disease? To this must, in many cases, be afforded a positive reply, since this very abeyance may be the chief characteristic of the disease whose presence is inferred. How, then, in the absence of unusual manifestations, are there grounds for such an inference? The response is—From the previous history of a particular case, and knowledge of the peculiar characteristics of the affection under consideration, and a contrast of the periods of physical and psychical repose. May not the exercises appertaining to either sphere be so far accomplished that, for the ordinary purposes of life, they prove sufficient? Pending this seemingly healthy state, some cause apparently trivial, or, it may be, considerable, occurs; a convulsion is unexpectedly produced, or a paroxysm of insanity follows. In both cases the predisposition requires but a slight occasion for its development, and in both cases, had the immediate exciting cause been prevented, the same semblance of health might have been maintained. This practical fact must ever be remembered, as showing the great difficulty enveloping the estimate of many cases in which, where insanity had been known to exist, but where its evi-

dences have subsided, acts of a criminal nature ensue. It is true that in many instances the mental disturbance is of such a decidedly recurrent character that those glimpses of reason which intervene between each paroxysm are justly regarded as but so many calms, whose occurrence is an occasion for thankfulness, even though their duration be matters of uncertainty. That during such intervals, acts, in every way indicative of perfect sanity, are accomplished, is not denied, wills executed in such intervals being held valid. It is contended, however, that we are not invariably at liberty, under circumstances of this nature, to infer that the mind is really sound because it is seemingly so; or to, in all cases, hold the individual responsible for actions of a criminal nature committed in such intervals, since the act to be considered may, in itself, be the developing of the latent morbid condition. It is this latter fact that must guide us in our estimation of such cases, while for their more particular appreciation, those general principles we have already discussed come into operation. We transcribe the observations of Dr. Combe on this point, as expressive of the condition of individuals who, having recovered from an attack of insanity, are again brought under examination: "However calm and rational the patient may appear to be during the lucid intervals, as they are called, and while enjoying the quietude of domestic society or the limited range of a well-regulated asylum, it must not be supposed that he is in as perfect possession of his senses as if he had never been ill. In ordinary circumstances and under ordinary excitement his perceptions may be accurate and his judgment perfectly sound, but a degree of irritability of brain remains behind which renders him unable to withstand any unusual emotion, any sudden provocation, or any unexpected and pressing emergency. Were this not the case, it is manifest that he would not be more liable to a fresh paroxysm than if he had never been attacked. And the opposite is notoriously the fact, for relapses are always to be dreaded, not only after a lucid interval, but even after perfect recovery. And it is but just, as well as proper, to keep this in mind, as it has too often happened that the lunatic has been visited with the heaviest responsibility for acts committed during such intervals, which, previous to the first attack of the disease, he would have shrunk from with horror."[63] Lord Brougham's views respect-

ing partial insanity are important, as showing how closely the reasoning of the philosopher corresponds to the experience of the physician, even though exceptions arise.

To those familiar with unsoundness of mind it is a matter of experience that by far the most dangerous class to be treated are patients who show the least evidence of their condition. Many recorded instances might be adduced where the most fearful crimes have resulted from very trifling causes, those causes being of a nature appreciable by the sane mind, and explicable by the ordinary occurrences of life. It is an error to suppose that rational motives acting on a disordered mind will not present equally lamentable results as the most extravagant suppositions. It matters not to the insane whether the motives be real or imaginary; they in their operations become transmuted, ordinary motives acquiring extraordinary significance. "It is, therefore, the relation of motives to the mental conditions at the period of the perpetration of the act, rather than the accordance of these motives of the character of the act," that should guide opinion. Were proofs required, we might quote many sad examples of suicidal and homicidal intent, accomplished during periods when the seeming quietude of the sufferer led to the relaxation of the close scrutiny previously preserved. The nature of such cases is so patent that the proposition of irresponsibility will be acceded to, and in individuals so afflicted the operations of disease cannot fail to be duly appreciated.

It here becomes a matter for consideration—How is society to be protected from the ill consequences of individuals so affected being at large? Such an inquiry, though full of interest, it would be foreign from our purpose to enter on. It seems, however, next to an impossibility that, in many cases, previous to the active development of their disease, any decisive measures could be adopted, since each separate case becomes a proposition in which the liberty of the subject, the unity of justice, and the well-being of the community are equally involved.

Passing from the consideration of mental conditions, which may be regarded as but so many lucid intervals, we are led to the estimate of cases in which, where insanity has been present, what may be looked upon as a permanent convalescence ensues, pending the continuance of which crime is

perpetrated. A question arises respecting the offender's accountability. We will presume it is established, from sufficient proof, that what is believed to be a complete recovery has taken place. The mere fact of insanity having existed, though being of itself a strong argument in favor of the accused, cannot be regarded as *per se* exculpating general vicious practices; at the same time, when the nature of insanity as indicative of disease is duly estimated, its tendency to relapse during convalescence and to recur when cured borne in mind, it will be acknowledged that in the estimate of criminal acts on the part of those who have been so afflicted, many important points for consideration arise. It is known that where a disease of a recurrent character has once been established, but a slight occasion proves adequate for its subsequent development; causes which to the ordinary constitution are innoxious, finding a morbid receptivity existing, acquire therein undue power, and eventuate in an unhealthy and exaggerated manner. The individual who has been insane must, therefore, in any unusual act, be always the object of suspicion. In many instances there is nothing to distinguish their mental state from that of ordinary persons, and in no way can the character of the act be associated with the nature of the previously existing disease. An inquiry arises respecting the relation of such acts to the mental condition of the accused, and of the accountability of the accused to the law. In the estimate of cases of this nature it must be borne in mind that there is no necessary connection between insanity and crime; that as regards the individual, crime and insanity can coexist; that as regards the law, an insane may be a criminal act; but, strictly speaking, there is no such occurrence as an insane criminal act. The insane act is not criminal, but a special manifestation of an existing disease, which circumstances direct into a particular channel. If we believe that no disease is present we divest the act of this important signification, and, reducing it to an ordinary fact, seek to inquire if, in a mind which may be presumed as being constitutionally weakened, the same capability of resisting inducement to crime exists. Experience affords a negative reply. It is not denied that by individuals who have recovered from attacks of insanity criminal acts entailing deep responsibility may be perpetrated; at the same time, it is a matter requiring but little argument that crime,

which at all times indicates deficient or defective mental regulation and excessive influence of evil passions, finds a diminished capability for resistance and a greater facility for adoption in the minds of men who have suffered from mental disease. The ordinary laws of our country, in their practical operation, recognize different degrees of culpability in reference to the same offence. We have, so far, a practical acknowledgment of a modified exercise of judicial authority which, in all instances where insanity has been known to have been once present, should be extended, and at least tend to the prohibition of capital punishment in such instances. This, with rare exceptions, appears to be the principle of judicial action.

In many cases, though reason is restored, the disposition seems to have undergone a complete change, which leads to the belief that the morbid action is rather kept in abeyance than wholly removed. When some unusual act occurs, conduct which had previously been regarded as of but trifling significance becomes invested with special interest. Many are ready to prove that grounds existed for inferring a return of disease, against whose results no precautions had been taken. Esquirol bears out the observations of Dr. Combe when he observes of those who have been insane: "They remain in such a state of susceptibility that the slightest causes give rise to relapses, and they only preserve their sanity by continuing to live at home, where no mental agitation or inquietude, no unfortunate contingency, is liable to occur, and throw them back to their former state." Other writers have corroborated this opinion. Admitting that many of the operations of insanity are very closely identified with those of vice, how, in such a case, is the responsibility to be determined? If the acts be regarded as indicative of returning mental unsoundness, in how much do they appertain to crime, how much to insanity? In all such cases the inquiry first arises as to whether the circumstances attending the particular act under consideration were likely to reproduce the psychopathic condition on which the individual's insanity had previously depended; an important element in such an estimate being the time which had elapsed since convalescence was declared. It next becomes requisite to investigate how far the character of the act responds to the presumed mental condition. On the first query, it must be

distinctly understood that as the possession of great abilities is no guarantee for the exercise of sound discretion, so the folly and vice displayed in any act or succession of acts cannot of themselves be received as indications of insanity. On the second query, the many difficulties which have been stated as investing the association of the particular act and mental state perplex inquiries. For the appreciation of such cases, the records of medical experience and the careful scrutiny of the physician should outweigh other considerations. We shall not attempt to suggest any rules for the guidance of those who may be called to their scrutiny, further than our previous observations afford, resting satisfied with recording the following opinion, to which, we believe, experience can add nothing: "In every criminal case where the question of responsibility arises in the course of judicial inquiry, if it be possible to establish any degree of positive insanity, it should always be viewed as a valid plea for a considerable mitigation of punishment, and as a *primâ facie* evidence in favor of the prisoner; and in no case where insanity clearly exists (without regard to its nature and amount) ought the extreme penalty of the law to be inflicted."[61]

We have drawn a distinction between acts resulting from such a deficient regulation of the mind as rests within the individual direction of the will, and similar acts originating from mental conditions beyond the control of the will. We may have in these opposed cases identical results as regards special crimes, proceeding from widely different causes. In one the individual acts, in the other he is acted upon. In both is a closely similar mental condition produced, since in neither is the power of self-regulation wholly lost, though in each it is perverted from its proper and healthy course. In the former, evil passions prevail over acknowledged obligations; the sense of enjoyment in immediate gratification placing in abeyance or surpassing the consciousness of its impropriety, crime results because the suggestions to its committal are presented to a mind whose energies are weakened, powers of resistance impaired, and tone vitiated by evil. In such a case, by withdrawing the temptation from without, and, through the adoption of physical and mental discipline, arousing the sense within, the mind may be restored to that vigor of action characteristic of health. With some individuals, exhortation

and remonstrance, by awakening new desires, place thereby motives of a higher order in successful opposition to natural or depraved appetites; the moral sense regains that supremacy which it had surrendered. In others, in whom the animal nature prevails, the infliction of personal suffering is requisite in order that their vitiated mental sensibility, acted on through their organism, may, in a sense of physical restraint or pain, find an adequate, though less worthy, motive for reform. In cases of this nature the capability of self-regulation exists, a distinct sense and consciousness of crime is present, but evil passions prevail. The moral faculties, ceasing to respond to the dictates of conscience, lose that direction which had hitherto guided them: the inducements to crime, acquiring increased power, prove adequate to subdue the intelligence for their fullest gratification, and, as a consequence, deliberate criminality results. The habit of evil once established, its progress is rapid; cunning directs the consciousness of responsibility, though recklessness denotes the abandonment of moral guidance: profligates glory in their shame and preserve a consistency in their infamy. Such a mental condition is not one of health, not one of soundness, in the true signification of the term, but indicative of a degenerate, depraved, abandoned disposition, where vice holds the position of disease, consequent on which the passions subdue the judgment, and not infrequently wholly disarrange the several faculties essential for its formation. The prevention and correction of such mental conditions are the objects of legislation. The well-being of society and the safety of the community demand that the fullest responsibility be attached to this self-induced state, this voluntary abandonment to evil, so long as the capability of directing and controlling his actions appertains to the transgressor.

The fact which Casper, Esquirol, and Pinel have established —that moral prevail over physical causes for the production of insanity—affords a deeply interesting subject for inquiry, as leading to the inference, which experience too sadly verifies, that it is through the moral or affective faculties the early indications of insanity are most frequently evidenced. Therefore it happens that so many cases of confirmed disease come under the notice of the physician, in which for treatment much valuable time has been lost, and in the association of

which no small risk has been encountered. Let a man be wicked, vicious, criminal; violate decency, live in profligacy, outrage society, as many are too often shown on their trials to have done; relations will still forgive those errors, for which their affection devises excuses and their self-interest plans concealment. They will attribute such conduct to wildness, weakness, or folly; admit the depravity of disposition which they deplore, the abandonment of principle from which they suffer, and in sorrow endure the infringement of every social rule which renders the domestic hearth a scene of perpetual misery and wretchedness. This they will not receive as evidence of insanity. Infamy rather than infirmity. There is something horrible in saying that one is mad. It runs in families. It will injure the prospects of the other members. Insanity is not a disease, but some vague, mysterious, intangible embodiment whose existence every one seeks to deny, in the expectation that oblivion will receive the evidence it has afforded when time removes those traces it has left.

It may appear, nay, it has been asserted, that notwithstanding this feeling there is a growing disposition to shield criminality beneath the plea of insanity. Several circumstances have conspired to favor this opinion. These circumstances rest in the marked increase in the number of the insane which late years have witnessed, and the juster estimate of the psychopathic relations of crime which their closer study of mental diseases enables physicians to form. The former is confirmed by the records of the various asylums throughout the United Kingdom. The latter especially bears out the observation of Dr. Pritchard, who some years ago thus wrote: "We doubt not that the time will come when the very names of many offences against decorum, now considered punishable crimes, will be erased from the statute book; and when persons now liable to be sentenced to the pillory or the gallows will be treated as lunatics." Real, practical benevolence finds in the application of medical truths additional incentives to commiseration, if not sympathy. In their appreciation of the illegal acts of the insane, standing between the violated law and an outraged community, the psychopathic physician has on the most important trials been compelled to listen to strictures on his evidence, tantamount in many instances to imputations against his integrity, from individuals whose posi-

tion demanded that, if they did not promote, they at least should uphold, those principles of justice which the testimony of the physician has, in the exposition of insanity, so frequently preserved inviolate. We do not contend for the infallibility of medical men. Were we to do so, we should reject the evidence which many of the most important trials of modern times afford; when matters of fact become converted into matters of opinion, the value of the latter varies according to the capability of the individual forming it. Medical science, while rejecting fixed rules, is dependent on just principles, whose cultivation and application rest in the anxious and earnest study of each healthy as well as morbid vital process.

It is this study which enables the physician not only to distinguish the nature of any disease which may be present, but also to determine if deviations from the normal processes are to be regarded as indicative of morbid action. In psychical, as in physical diseases, attempts at imposition will be observed. Notwithstanding the assertions of Georget, Haslam, and others, that "to sustain the character of a paroxysm of active insanity would require a continuity of exertion beyond the power of a sane person," or that "no person who had not made the insane a subject of study can simulate madness so as to deceive a physician well acquainted with the disease," instances are on record, in which, for the escaping of just punishment, such a deception has been successfully carried out. We may especially direct attention to the following example. "A case is recorded of a young shepherd, named Specht, of previous good health, lively manners, and great intelligence, residing at Hegelensheim, on the upper Danube, who, having violated and shot a young girl, avowed his crime, and declared that the devil had incited him to do it. Next day, when brought before the magistrate, he seemed to have lost every physical and mental faculty; he could not stand without a great effort, and only answered in incoherent and isolated words. He pretended to be deaf and to have lost his memory, could recognize no one, and afforded no satisfactory answer to any interrogatory. MM. Windler and Zinc, the experts employed to examine into the state of his mind, were both of opinion that the condition was simulated, inasmuch as the degree of imbecility he pretended to exhibit could only be congenital, and there was no example of a person of such excel-

lent parts as he possessed prior to the occurrence becoming suddenly imbecile: for imbecility that is not congenital only comes on and increases gradually. The prisoner was watched for fourteen months, and various plans tried. He still continued the same. The medical men maintained their opinion. He was then sentenced to three years' imprisonment, and, on returning to his cell, he threw off the imposition and leaped for joy. He had been advised to feign insanity by a fellow-prisoner."[65] This remarkable instance confirms the opinion of Ray, who differs from the authorities last quoted, in the assertion that "nothing requires a severer exercise of a physician's knowledge and tact than a case of simulated insanity." For the detection of such cases, the same principle of successive observation which seems to have so truly guarded the opinions of MM. Windler and Zinc promises the surest safeguard against error.

We might proceed at greater length to draw distinctions between that unsoundness of mind or mental condition in which vice prevails and that unsoundness of mind which results from disease, and adduce many examples in which the practical similarity between the two enveloped in the greatest obscurity their essential difference. Enough on this point has been already written. We cannot rationally expect that the passions of man will ever be so completely subjected to his reason as to enable him to avoid all the moral and physical evils which depend upon his own conduct. Crimes have, therefore, been measured by the injury done to society, and thus it occurs that a vast amount of moral guilt is suffered to pass unheeded, simply, as it appears, because its operations are limited in their pernicious consequences to the individuals immediately involved in its participation. When, however, aggression ensues, morality, awakened to a sense of personal safety, becomes invested with power and transmuted into law, consequent on which the penalties of such practices are enforced.

For this object, the system of British legislation which intrusts to the deliberate judgment of an impartial jury, guided and directed in their deliberations by the calm experience and disciplined mind of a judge, the honor, interests, and life of the community, is admittedly unequalled. When circumstances arise demonstrative of the defects in the practical operation

of that system, it becomes not only the privilege, but also the duty, of each one to discuss without prejudice, that they may determine without passion, on the nature of the error present and the means most suitable for its removal. Public opinion needs but to be directed into the true channel, the public mind being possessed of a code of innate jurisprudence, of which our natural sympathies will ever continue to be the best conservators. To the inculcation of just legal and medical principles must we therefore look for the surest preservative against a repetition of those errors in judgment which have led to the condemnation of insane offenders—events that, when the excitement attendant on their execution has past, bear neither the test of calm reflection nor philosophic scrutiny.

To increase the difficulties of expert evidence, curious phases of medical opinion are occasionally manifest. A disposition arises for subtle analysis of unusual forms of mental disease, when not unknown combinations are treated as something entirely new, and, receiving fresh names, paraded as discoveries, rather than illustrations, of psychopathic science. Thus Professor Proust, in a lecture before the Académie des Sciences in Paris, has pointed out cases of double mental personality, in which epilepsy and hysteria, aggravated, if not induced, by cerebral injuries, have resulted, as it were, in a dual existence—virtuous one day and vicious the next.

M. Canot, at the Salpétrière, and M. Henri de Purville, in a recent number of the "Journal des Débats" on amnesia, or loss of memory, detail examples of somewhat similar alterations in character and feeling. Many might be disposed to accept such vicarious conditions as explanatory "of sudden and unreasoning crimes," for which no more practical causes immediately present themselves. To those, we would repeat the words of one of the greatest medical philosophers of the present century:

"Now, to believe that medicine has been brought to its greatest possible perfection would seem opposed to all analogy and probability. It is a science of observation and induction, but dealing with phenomena of which some are constant, others varying, presenting new characters and infinitely various combinations.

"Hence the necessity for an eclectic system, or that which seizes on the true, of whatever time, or from whatever source

it comes, arranges all the facts within its reach, and modestly admits its incapability of explaining many things, of the existence of which it entertains no doubt." [66]

These observations are to the psychopathic student encyclopedic in their teaching.

In concluding our inquiries on the important subject of "unsoundness of mind in its legal and medical relations," we may observe that in its investigation our great object has been to point out difficulties rather than to offer rules. We have wished to identify law and physic for the purpose of justice—to preserve them separate for the furtherance of truth. Justice demands on the part of law that the criminal be punished. Truth requires from justice that the insane be held, as regards the law, irresponsible. The object of both the lawyer and physician must be regarded as being, for the purposes of justice and truth, identical, even though the principles directing the practical application of their several sciences be different. At no period was it of more importance that the awakened intelligence of mankind, which on all sides is active in the pursuit of knowledge, should know and feel that medical science, despite the difficulty, if not obscurity, investing its practical elucidation, is still, in mental as in bodily derangement, the instrument which should guide our proceedings, either for the restoration of individual health or the preservation of public safety.

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BALDNESS AND GRAYNESS;

THEIR

Etiology, Pathology, and Treatment.

BY

TOM ROBINSON, M.D.

BALDNESS AND GRAYNESS.

CHAPTER I.

ANATOMY OF THE HAIR.

The Human Skin.

Before proceeding to the structure and functions of the hair, we must premise some observations on the nutrient soil in which the hairs are implanted, namely, the skin. The outer covering of the body, having to serve at once as a protection for the more deeply-seated structures and as an organ of tact, touch, secretion, and excretion, is necessarily not only a very compound tissue, but also a very complex apparatus.

The skin mainly consists of two parts, viz.: the true skin (cutis vera or corium, derma) and an external layer named the scarf-skin (cuticle or epidermis). The true skin, which rests upon a layer of fatty and cellular tissue, strong, tense, and tough, is nevertheless highly elastic and yielding, and being composed of fibro-cellular tissue, interwoven in all directions, numerous spaces or areolæ are formed, which, in the deeper layers of the skin, usually contain little masses of fat. The surface of the true skin is beset with small eminences named papillæ, which appear chiefly to contribute to the perfection of the skin as an organ of touch, as we find them highly developed in parts where the sense of touch is exquisite, as on the hands and fingers.

The glands of the skin are of two kinds—the sudoriparous, or sweat glands, and the sebaceous, or oil glands. The sweat glands exist in all regions of the skin, but they are not equally abundant everywhere. Each sweat gland is supplied with a number of capillary vessels. The total number of these sweat or perspiratory glands has been estimated at nearly two millions and a half. Besides the perspiration, the skin also se-

cretes a fatty matter by the sebaceous glands before mentioned, which exist in all regions of the body, though not equally numerous in all parts. The skin thus constitutes a vast emunctory, by which a large amount of fluids and gases is eliminated from the body.

The epidermis, cuticle, or scarf-skin, forms a protective covering over the true skin. It is non-vascular and insensible. The thickness varies in different parts of the surface from $\frac{1}{12}$ to no more than $\frac{1}{40}$ of an inch. It is thickest in the parts much exposed to pressure. The cuticle is made up of flattened cells agglutinated together. Many of these cells contain pigment granules, which are contained principally in the cells of the deep layer, called rete mucosum, or mucous web. Thus, the color of the skin of the Negro, the European, and other races, owe their shades to the intermixture of the pigment cells in different proportions in the respective localities of their scarf-skin. Generally speaking, according as the pigment cells are more limited to the lower surface of the Malpighian tissue, or are more massed together in an upward direction, so will probably the darkness of the skin proportionately increase. A Negro child is not born black, but of a nut-brown color. The full color does not, according to the late Pruner Bey, appear till the end of the first year in the Soudan, and only in the third year in Lower Egypt. (Vogt: "Lectures on Man," edited by Dr. Hunt. Anthropological Society's Publication.)

The Muscles of the Skin.

The muscles of the skin are, as is well known, of two kinds, the unstriped, and the striped variety. The latter presents, under the microscope, transverse striæ, which occur in all the muscles usually termed "voluntary," although not limited to these alone. These striated, or striped muscles, may be detected in the face, forehead, and nose. The non-striated muscles, which are far more abundant, are found to be connected with the hair follicles, and are called erectores pili (erectors of the hair). They exist in bundles, either on one or both tiers of the hair follicle, and they also more or less inclose the sebaceous glands.

The hairs are modifications of the cuticle. They are found

on nearly every part of the surface of the body, excepting the palms of the hands and the soles of the feet.

A hair consists of a root which is implanted in the skin; a shaft or stem, and the point. The root of the hair swells out at its lower end into a bulbous enlargement, which is received into a recess of the true skin, named the hair follicle which, when the hair is of considerable length, reaches into the subcutaneous cellular tissue. The hair follicle receives near its mouth the opening ducts of one or more sebaceous or oil glands, and consists in structure of an inner or dermic coat, which is continuous with the skin, and an epidermic lining continuous with the cuticle. The outer coat is highly vascular, and is abundantly supplied with minute nervous filaments. When a hair is plucked from its follicle, the cuticular lining, or its inner coat, commonly adheres to it, forming what is called the root sheath. The soft bulbous enlargement of the root of the hair is, by its base, attached to the bottom of the follicle, and this part of the follicle, which is in reality a part of the true skin, although sunk beneath its surface, supplies the material for the production of the hair. There is, at the bottom of each hair follicle, as Kölliker has shown, a vascular eminence, or papilla, similar to those found upon the surface of the skin, which is continuous with the dermic layer of the follicle, and being highly vascular, and no doubt supplied with nervous fibrils, is subservient to the growth of the hair. The papilla must therefore be looked upon as the most important part of the hair.

The shaft is covered with a coating of fine scales, covering a fibrous substance, which in most cases forms the chief portion, if not the whole, of the shaft. In many hairs the centre is occupied by a different substance, named the medulla, or pith, in which case the surrounding fibrous part is often called the cortical. The length and thickness of the shaft vary greatly in different individuals and in the various races of mankind, and also in the different parts of the body. The shape of the hair shaft has been differently described by different authors, so that Leuwenhoek, the microscopist, said, "in many hairs as many shapes" (quot crines tot figuræ). Modern researches have shown that the human hair is seldom round, but rather flattened, so that its section appears oval or kidney shaped. The diameter of the hair has also been variously

stated. It varies according to locality and age. Beard hair is from $\frac{1}{250}$ to $\frac{1}{300}$ of an inch; head hair, $\frac{1}{400}$, $\frac{1}{600}$ of an inch from a little child. The curliness of the hair depends, according to Weber, on its flatness; the flatter it is, the more it curls. The strength of hair depends upon its length, thickness, and flexibility. The microscope has, in short, revealed the fact that the hair is not perfectly cylindrical, nor a tube, as was long believed. Except at the base, into which the pulp enters to a variable distance, the hairs are perfectly solid. The surfaces of the hair are not smooth, but laminated—the laminæ being placed over each other in a slanting direction, like the scales of a fish. Hence, a hair drawn between the fingers from base to tip moves smoothly, but by reversing the motion the roughness will become perceptible.

The beard and all short curling hairs are flattened, and flatness and curliness are in direct proportion. Both attain their maximum in the Negro. The medullary substance (medullary canal) is not regularly met with in all hairs. This constituent is absent sometimes in head hair, and almost constantly in woolly hair. In dark hair this substance is only seen after long hair has been bleached by diluted nitric acid. The medullary substance may be isolated by boiling the hairs in caustic soda, and tearing them. Falk and Henle asserted that no medullary canal is met with in the hair of children under six years. Oesterlin ("Das menschliche Haar," O. Oesterlin, Tübingen, 1870) denies this, as he had found it in the hair of children of only two years old. Oesterlin also dissents from Pfäff, who considers the medullary strand as the chief carrier of the hair pigment. He agrees with Griffith, Mandl, Kölliker, and others, that the supposed black pigment is simply air, but where these air bubbles have their seat, and what is their physiological significance, is as yet an open question. The medullary substance, where it exists, is not always in the centre, but sometimes at the margin of the hairs, which is especially the case in flattened or triangular hairs. Sometimes, says Pfäff, the medullary substance forms in one and the same hair two pigment strands. The medullary substance does not in all hair form from point to root a continuous accumulation of cells, but there are seen at intervals cells which are filled with masses of the internal cortical substance, which by their texture form a marked contrast to the roundish cells

of the medullary substance. Under these circumstances we cannot strictly speak of a medullary canal, as the medullary substance by no means fills the centre of the hair in its whole length.

The eyebrows have a length of about from two to three inches; they lie in an oblique direction above the orbits. Anatomists have divided the arches which they form into the head, the body, and the tail. The head commences at the root of the nose, and sometimes coalesces with the head on the opposite side. The body extends along the orbit and the tail terminates at the temple. The eyebrows approach more or less, and sometimes seem continuous. The individual hairs of the eyebrows are cuneiform, stiff, short, thick, and lustrous, terminating in a thin point. Whatever be the form of the eyebrows it necessarily depends on the form of the orbital arch of the frontal bone; the more gentle the arch toward the temple, the more pleasant its form.

The eyelashes (cilia) are like the hair of the eyebrows, short curved hair. They are arranged in two or more rows along the edges of the eyelids at the line of union between the skin and the conjunctival mucous membrane. The lashes of the upper lid are both more numerous and longer than the lower. The hairs of the upper lid are curved upward, those of the lower curved downward. The rows of the cilia vary; there are sometimes four rows in the upper eyelid. Both the cilia and the supercilia are distinguished from the rest of the hair by the definite degree of their growth, by their slow reproduction which, when they are cut, is not effected until the lapse of two years to recover their previous length. Finally, the eyelashes rarely become gray, and moreover, proceed by way of exception, straight from the skin; all the rest take a slanting direction, more or less. This is best seen in the crown of the head.

Number of Hairs.—As already stated, the hairs are unequally distributed on the human body. In most cases the head is the most hairy part. Withof found in a moderately hairy middle-aged man, in a quarter square inch of the top of the head (vertex) 293 hairs, on the back of the head (occiput) 225, and on the front part (sinciput) 2,111; on the chin 39. But the numbers vary considerably, according to age and color. Upon the surface of a quarter of an inch Withof found

black hair, 147; brown, 162; and blond hair, 182. It seems, therefore, that black are the thickest, and blond the thinnest. The number of hairs on the face, whiskers, beard, and mustaches, varies greatly in races and individuals.

Weight.—The weight of the hair naturally depends upon its length and thickness. It is rare that the head hair weighs more than 12 ounces, although in a few instances it has been found 14 and 16 ounces. Absalom's hair "polled" once a year is said to have weighed 200 shekels; according to Geddes 112 ounces.

Hair Intermediate.—Oken observes that the hair formation forms the connective link between animal and vegetable tissue. His words are: "The fur is the peripheral connection between the plant and the animal. The hair forms the summit of the vegetables. As the plant requires air and light, in the animal kingdom the hair appears where it is most exposed to those elements, namely, on the surface. It is not a little remarkable that those mammals which stand nearest to men, the anthropoid apes, are distinguished by their great development of the capillary system."

The ancients appear to have had a fair knowledge of the structure, growth, and use of the human hair. Pliny (Lib. XI., c. 94) says: "The hair of man is partly born with him, and partly produced after his birth. The hairs that issue from a thick skin are coarse. When cut, the hairs shoot out from the place where they have been cut, as is the case with grass cut at the root. The hair also grows quickly in certain diseases, especially in phthisis, also on the body in old age."

As regards the eyelashes, Pliny observes (L. XI., c. 59): "Man has lashes on the eyelids, and women daily stain them to add to their beauty. Nature, however, has provided the hair of the eyelashes with another view—as a protection of the sight against the approaches of insects and other objects."

The nails are, like the hairs, growths of the cuticle, with this difference, that the uppermost or horny layer, which forms the actual nail, is more developed. The posterior part, which is hidden in the groove of the skin, is the root, the uncovered part is the body terminating in front by the free edge. That portion of the nail near the root which is whiter than the rest, is from its crescent shape called the lunula. That portion of the skin to which the nail is attached, and by which in fact it is generated, is called the matrix.

The growth of the nail is almost, like that of the hair, effected by a constant generation of cells at the root and under surface. In consequence of the addition of new cells at the posterior part, the nail is made to advance, and by the opposition of similar cells on its under surface the nail grows in thickness. The nails, like the hair, grow more in summer than in winter time, and they also appear to differ in each finger.

CHAPTER II.

PHYSIOLOGY OF THE HAIR.

Growth and Development.

It is about the end of the third month of intra-uterine life that the hair begins to form, when it appears in the shape of minute black spots beneath the cuticle. At the period of birth, the head hair varies in length from one to four centimetres. As occasionally infants are born with teeth, so are there sometimes babies born with a "shock head" of hair. Commonly, the hair is very scanty at this period, and only thickens toward the end of the first year. The dimensions which the hair acquires at a later period greatly vary, according to the constitution, sex, race, and descent of the individual. It is well known that the female hair attains a greater length than that of the male. Grellier ("Dissertation sur les cheveux," Paris, 1806) supposes that this is owing to the greater abundance of cellular tissue beneath the scalp, so that the hairs find on the female head a more congenial soil for their nourishment and development, while Dr. Lewis Grion attributes the difference in the two sexes to the accumulation of electrical excitants in the female. Numerous cases are recorded of ladies whose hair reached the length of six feet, and swept the floor. The writer of this treatise saw a few years ago a young lady promenading at Yarmouth jetty, rejoicing in a *bona fide* crinal appendage more than five feet in length. The mean diameter of the hair is, according to E. H. Weber, 0.04 of a line. This diameter depends chiefly upon the color of the hair. A square inch of scalp contains, according to Withof, 5,072 black, 608 brown, and 790 fair hairs. The number of hairs upon the head will therefore vary according to their hue, and it has been found that while a flaxen-haired beauty has from 140 to 150,000 hairs on her head, a black-haired belle has only from 100 to 110,000, while a red-haired one has only about 20,000 hairs on

her head. The hair possesses great power of resistance, and is capable of supporting a greater weight in proportion to its volume than most of the fibrous substances. Weber says that a hair ten inches long is capable of being extended one-third of its length, and this elasticity is so great that after being elongated it recoils, and is but $\frac{1}{13}$ longer than it was before the traction.

Microscopic observation has revealed the important fact that the capacity of absorption and excretion possessed by the hair are about equal, and that the reciprocal action of the air and the living organism is not merely effected by the skin and the lungs, but that the hair plays a by no means unimportant part in the process. In baldness, the hair has lost its excretory and absorbent canals. The harmony of the animal economy is disturbed, hence the organs, the skin, and the kidneys perform vicariously the work of the hair. The scalp perspires much more than before, and a sediment in the urine is found (for a considerable time) which was not to be observed previously to the loss of hair.

Hair as an Organ of Tactility.—Mr. Jobert in a communication to the French Academy, gives the result of his researches on the tactile faculty of the hair in different regions of the face. It is well known that in many mammals the hairs form a tactile apparatus of exquisite sensibility. He found that in man, the eyelids are provided with numerous nerves presenting very remarkable connections with the follicles of the eyelashes, so that the latter possess tactile facilities. The skin of the cheek bones, of the wings of the nose, of the lips and the chin, also possess hair with a nervous apparatus, though in a lesser degree than those of the eyelids. The nerves, frequently accompanied by blood-vessels, always enter beneath the sebaceous glands. The numerous connections of the nerves with the hair follicles force us to accord to these small organs a certain importance in appreciating the sensation produced by certain external objects, especially the movements of the air waves.

Transplantation of Hair.—Tieffenbach in his dissertation "Nonnullæ de regeneratione," 1882, says that hairs may be transplanted from one organism upon another. He inflicted upon his own arm with a puncture needle, several punctures, and inserted six superciliary hairs taken from a friend. Of

these six, two became fixed, two dried up and fell out, while two were expelled by suppuration. This suggested to him the artificial implantation of lost eyelashes, in which he several times succeeded. By transplanting some of his own head hairs on his arms, they became fixed, and the roots became strong and thick. Even of the white hairs of an old man, one became fixed.

Temperament.—The mental disposition, and even the psychical strength is believed by many to be indicated by the hair. Black, curly, and stiff hairs are said to indicate a melancholy temperament; fair hair, a sanguine or phlegmatic temperament; and red hair, either a very cunning, or a very good character. Hence it was said we meet in prisons with many red-haired women, and black-haired men; rarely with fair-haired criminals. Yellow or red hair is rarely found among maniacs. Very red hair sometimes indicates a scrofulous disposition. All this is, of course, subject to so many exceptions that it is scarcely to be relied upon.

The chemical composition of hair is nearly allied to that of the other horny tissues of the body, such as the cuticle and the nails.

Hair consists of carbon 49 to 50 per cent; hydrogen, 6.66; nitrogen, 17.93; sulphur from 3 to 5 per cent; oxygen, about 21 per cent. These quantities vary according to color and other circumstances. Thus Bibra found in some specimens of red hair, the oxygen to amount to nearly 8 per cent.

Hair is indissoluble in water. Nitric acid turns it yellow; hydrochloric and sulphuric acids dissolve it, forming rose-colored solutions. Many salts and metallic acids and also some organic substances change the color of red or white hair to black. A solution of nitrate of silver in ether, or the same salt mixed with lard, oil, slaked lime, or pyrogallic acid is frequently used for blackening the hair.

Does the hair grow after death? Opinions are divided. Old Heister ("Compend. Anat.," 1741), denies that the hairs grow after death, as he had convinced himself by experiment (sicut certo experimento edoctus sum), while Dr. P. Rommelius ("Ephem. Nat. Curios.," Dec. 11, Ann. VI.), is as certain that they do. Rommelius (obs. 226) records the case of a healthy strong peasant with green hair. He also gives cases of green sweat. In Ann. VII., obs. 155, we find the case of an old man

of Kiel, whose hairs on the head were green. Borellus (Cap. II., obs. 56); Bartholinus, Essert, and others, all speak of green and blue hair, which are now generally ascribed to metallic vapors.

To a certain extent the hair has an independent life. The growth of the hair after death has been, as is already mentioned by many physiologists, held to be fabulous. On the other hand, Villerme ("Dict. des Sciences Médicales," Tom. V.), Bichat, and Puiset, insist upon the growth of the hair and beard after death. The latter gives the case of a father who, from affection, had kept the body of his son, and perceived that the beard after shaving had grown again. Bartholinus also relates that the cut-off hair of a corpse had grown up again yellow. In anatomical theatres, frequent opportunities must occur to observe the phenomenon.

When the parish church of Turvey, Beds, was undergoing restoration in 1854, a large stone was raised which some three hundred years ago had been placed over the remains of the Lady Johanna, wife of the second Lord Mordaunt. Her remains appeared in a shroud of yellow silk, which retained its color and firmness. Her dark auburn hair had grown so much after death as to fill up the space around, and form a mould for the head ("N. and Q.," Vol. VI., 1870).

The following singular story appeared in Hawthorn's "English Note-book," Vol. I., 96: "The grandmother of Mrs. H—— died fifty years ago, at the age of 28. She had a head of beautiful chestnut hair. When the tomb was opened, in 1853, her coffin was found to be filled with beautiful glossy ringlets, into which her whole substance seems to have been transformed, for there was nothing but these shining curls, the growth of half a century, in her tomb."

In Sir Henry Halford's account of the opening of the coffin of Charles I., in 1813, it is stated: "The pointed beard so characteristic of the reign of King Charles was perfect. . . . The hair was thick at the back part of the head, and in appearance nearly black."

Most of the old writers believed in the growth of the hair after death. Aristotle ("Hist. an. Lib.," III., c. 11) says in the Latin translation: "Etiam in senectute et defunctis pili augentur, sed non nascuntur." "We also see that in old age and in the dead, the hairs grow, but are not born." There is scarcely

any author of the middle ages who did not believe it. Garmann ("De Miraculis Mortuorum," Lib. I.) says that the hair grows after death on all bodies of young persons, or of such who died a violent death. "In such cases," he continues, "the nutrimentum capillorum remained in excess." There are, nevertheless, not wanting respectable authorities who utterly deny the growth of the hair after death. Ruysh ("Thesaur.," IX., says: "Sepulcra intravi et nunquam contrarium observavi. . . . Vide nec capillos crevisse nec ungues post-mortem," etc. "I have gone into the graves, and have never observed the contrary. We may see that neither the hairs nor the nails grow after death." Among the modern writers we find that Haller ("Elem. Physiol.," § 18, T. V.) declares the phenomenon to be an illusion. Garmann ("De Miraculis Mortuorum," Lib. I., tit. 1, § 7) says that the hairs of criminals who were hanged in chains became gray. Similar instances are given in "Ephem. Acad. Nat. Curiosorum."

Hair Standing on End.—The Rev. Dr. Andrews, of Beresford Chapel, who had been requested to attend William Probert, who had been concerned in the murder of Weare, for which Thurtell was hanged in 1824, writes that "on the morning of execution the culprit seemed anxious to listen and to join in the prayers. On leaving the cell, and going to the room where he was pinioned, he became excited, and the instant the executioner put the cord to his wrist to bind his hands, his hair—long, lanky, weak, iron-gray hair—arose gradually, and stood perfectly upright for some time, and then as gradually fell down."

That these phenomena are the results of fear and horror has been known for ages. Job iv., 13, 14, 15: "The hair of my flesh stood up." But it was not known that the hair follicles are provided with muscles and nerves. The muscular fibres are, by nervous influence, caused to contract, the follicle is protruded, and the hair it contains stands erect. The same effect may be, as is well known, produced by electricity. Cold as a physical agent, and listening to a horrible story, as a moral agent, will produce what is called a "goose-skin," which is simply the result of the contraction of the muscular fibres.

The epidermic coat of the follicle adheres so closely to the root of the hair that it commonly separates therefrom when a hair is pulled out. It is hence frequently called the "root-

sheath." It consists of two layers; of an outer more compact stratum; and an internal more transparent layer. The outer root-sheath corresponds with the mucous layer of the epidermis, and contains soft cells, including pigment granules, which can be distinctly seen in the follicles of the skin of the Negro. The inner root-sheath forms a firm, transparent yellowish membrane, extending from near the base of the hair follicle, and near the mouths of the sebaceous follicles, where it terminates abruptly. It appears to be a homogeneous membrane, but when it is very closely examined, it is found to consist of two or three layers of cells. The outermost layer (Henle's layer) consists of long, flattened, non-nucleated cells. The innermost next to the cuticle is known as Huxley's layer, and consists of one or two layers of shorter and broader polygonal cells.

Rate of Growth of Hair.—According to Krafft ("Novi Commentarii"), the growth of the head hair amounts in the year to two and four-ninth inches. Withof ("De Pilo Humano") says it grows four inches within a year. Haller computes the growth at four and one-half inches within twelve months.

The experiments made by these physiologists did not apparently rest on strictly scientific principles. Berthold is of opinion that the growth of the hair might be best observed in females who have lost their hair in consequence of a fever. He found in such cases that in young females, say from sixteen to twenty-four, the hair grows at the rate of seven inches in twelve months. The growth of the hair is greater in summer than in winter, and more copious during the day than during the night.

Shedding of the Hair.—Kölliker affirms that after birth, a total shedding of the hair takes place by new hairs arising in the follicles of the downy hairs, and gradually displacing the old ones. He also thinks that in many children the hairs of the head fall out from two to six months after birth, and are replaced by new ones. As in the earliest periods of life, the cast-off hairs are replaced by new ones, so we find something similar occurring at a later period, and it is quite certain that during the vigorous period of life, there is a continual replacement of the numerous hairs which are shed. When the hairs which have fallen out after a severe illness are re-

produced, it is more probable that they are developed in the old follicles than that they are entirely new formations; since, according to E. H. Weber, the follicles of cast-off hairs continue to exist for a long time.

Nutrition of the Hair.—The mode of nutrition of the hair may be observed by taking from a body, a piece of hairy skin and examining by means of a microscope the subcutaneous tissue. All around the bulb, we see the finest loops of the capillary blood-vessels, and also offshoots of capillary vessels, which are imperceptibly lost near the hair bulb, and form no doubt the intervening link between the soil and not only the plant, but also the medium between the atmospheric, electric, or maybe miasmatic conditions of the external world with the organism. Analogous to the capillary vessels, the most delicate nervous plexuses send processes to the bulb. True, the human eye as yet has not been able to follow these nervous threads, but that they reach the bulb, there can be little doubt. The pain on pulling the hair decides this. We are aware that the least highly-organized tissues are capable of being reproduced, after having been destroyed. Cases have occurred that when the original stock has been destroyed in the scalp, a new stock may be developed by the powers of nature, and that an entirely new crop of hair arises, and so it is with the teeth. Dr. Curran related to Dr. Graves that Mrs. Waterworth, Curran's grandmother, who died aged 95, when about 80 got a complete new set of teeth. In Easton's work on longevity, particulars are given (from manuscript) respecting one Mary How, of Mapleton, Derbyshire, who at the age of 110 got several new teeth, while her hair resumed its former color. John Minnerker, of Maryport, Cumberland, had such an abundant crop of new hair between his 80th and 112th years that twenty wigs were made of it during that period.

Permeability of Hair.—Physiologists agree that the hair consists of matter somewhat analogous to horn or nail. For practical purposes, we may consider the hair to resemble a plant imbedded in the surface of the body, and consequently its healthy or diseased functions must be connected not only with changes occurring in the hair and its bulb, but with those which take place in structures more immediately in contact with the latter. Thus, the hair may cease to grow, and baldness ensue, as in old age, from decay and absorption

of the bulb itself, or the same result may in youth be produced by causes which injure the vitality of the bulb or change the structure of the skin in which it is implanted. The fully-developed hair, although destitute of vessels, is not a dead structure. The vital changes, says Kölliker, going on in it are as yet shrouded in obscurity, but we may be assured that it is permeated by fluids, and employs them for its nourishment and maintenance. The hair must therefore be regarded as endowed with life, and dependent in a certain way upon the entire organism, not upon the skin in particular. The falling out of the hairs certainly depends in many cases merely on the want of the necessary natural material. The whitening of the hair is doubtless partly to be referred to the same cause. The well-authenticated cases of the hair rapidly becoming white are interesting, and speak strongly for the vitality of the hair, although it is not yet known what peculiar processes in the elements of the hair occasion the decoloration.

Transpiration of the Hair.—It is a very old idea that the hairs act as flues which carry off noxious vapors from the head (Galen, "De Usu Partium," cap. 19, de pilis). In fact, all physiologists who were unable to indicate a special use of the hair assigned to it an excretory function. Haller believed that the hairs transpire at their points, and perhaps at their whole surface. Fourcroy thought that the use of the hair consisted in excreting an excess of phosphoric acid, which led Vauquelin to assert that the hair in various animals assumes the functions of urinary organs. This much seems pretty sure, that the hairs are subservient to the excretion of some substance either in gaseous or liquid form. It is because the hair possesses partly the function of transpiration, that it became the carrier of a contagion. Hence in cases of pestilential diseases, the greatest watchfulness is requisite at the introduction of hairy and woolly materials. That the hairs possess the power of condensing, so to speak, the electric fluid, and must be considered bad conductors of electricity, is certain; and insomuch as electricity plays an important part in all vital processes, the function of the hair certainly deserves greater attention than it has hitherto obtained from physiologists and pathologists. We know that the shaft of the hair is normally insensible, and may be cut, twisted, fixed, and bent in every direction, without giving rise to any sensation; neither does

the shaft possess any independent motion. Under certain conditions, nevertheless, it seems to acquire both. Thus the hair, as we know, becomes erect under certain emotions, as well as under the action of electricity. That the erection arises from the action of the skin or the bulb is certain; but the question is whether the movement in the shaft be entirely passive, or whether the fluid be accumulating in the cellular tissue similar to that of the blood in erectile tissues.

That the hair is both idioelectric and hygroscopic is well known. Long ago Dr. Bridone obtained from hair by mere friction sufficient electricity to kindle spirits of wine, and several cases are cited of persons whose beards and hair became luminous when they were in a great passion. A singular case is reported by Dr. Lodere of a young man who among his black hairs had a tuft of dark red hair which turned scarlet, like the crest of a cock, when he was in a passion.

Hairs being hygroscopic, they readily imbibe and give out moisture, and become longer or shorter according to the state of the atmosphere, and hence their employment as the barometers seen in toy shops.

Nerves. — Dr. C. Arnstein ("Sitzungsberichte," Vienna, 1876), in a lecture "On the Nerves of the Hairy Skin," found in the human hair, especially that of the head, very frequently nerve-fibres in the sections, so that he does not hesitate to affirm that every hair is provided with a nerve. He also found the feather-bags of birds provided with nerves.

That the hair of albinos differs chemically from normal healthy hair, has been proved by Sachs. He found that 500 grains of his own yellowish-white hair produced only from one to two grains of ashes which gave lime, 0.368; magnesia, 0.75; no iron and no silica, while a limited quantity of black hair produced 37 grains of ashes, which yielded 2.116 of lime, 0.9 of magnesia, and 0.2 grains of oxide of iron. King Hystaspes is said to have had a daughter of the name of Charidea, whom he would not recognize as such, because she had a perfectly fair skin and white hair. According to Pliny, Albania has received this name from albinism being endemic in that country.

CHAPTER III.

COLOR AND TEXTURE OF THE HAIR.

We have seen that the color of the skin resides in the epidermis or cuticle, so that the various shades presented by different races and individuals are due to the comparative amount and relative admixture of the pigment cells. In the same way the color of the hair depends on the amount of the pigment granules diffused through the cortical substance of the hair. Thus, to take an extreme case, the entire absence of the pigment globules gives rise to that anomaly called albinoism, or albinism.

Apart from the pigment granules, the air-vessels in the hair have recently much occupied the attention of microscopists, with regard to color, as will be found in another place.

With some exceptions, we find that as a rule, the color of the hair harmonizes with that of the skin and the iris, although it is not rare to find red-haired ladies with brilliant black eyes. Black is undoubtedly the predominant color of the human hair, and we consequently find it in all parts of the globe. Light hair with its various shades, from flaxen, light brown, chestnut, golden, to fiery red, belongs to comparatively few families of the human species, and these chiefly (though not exclusively) inhabit Europe and the colonies established by Europeans. In Europe we find dark hair, as well as dark complexions, gradually diminishing as we approach the north until we reach Scandinavia, where light hair is dominant. Further north the hair again becomes darker, so that the Lapps and Esquimaux have dusky complexions and dark hair. This applies also to the antarctic zone.

Excess of Pigment.—According to Heusinger, the pigment may be so abundant as to soil the hand touching it. Ladies in southern parts sometimes complain that their jet-black hair spoils their head-gear. Such cases are probably due to excessive transpiration.

In a paper on the coloring matter in human hair, read by Dr. Sorby at the Anthropological Institute, the author described the mode by which the coloring substances may be separated. Although four different pigments have been obtained, Dr. Sorby thought that the general color of the hair is mainly due to black and brown red pigment, both of which may easily be obtained in a separate form, and used like water-colors, as shown by many drawings exhibited. All the various tints which the human hair presents were due to a variation in the total or relative amount of the red and black pigments.

That latitude, light, and heat influence to a considerable extent the color of the skin and hair is undeniable, wherefore we find the deepest shades of black chiefly near the equator, whether it be in Africa, India, or America, but neither temperature nor the rays of the sun can be considered as the sole factor in the production of the deep color of the skin and hair.

Hair as a Race Character.—The color of the skin and of the hair have always more or less fixed the attention of travellers and anthropologists with reference to the classification of the human species. Thus, as is well known, Blumenbach assumed five races according to their color: the black, brown, yellow, red, and the white race. Dr. Prichard grouped them under three varieties: the melanocomous (black-haired), the leucous, or white variety, and the xanthous, or light-haired. But the color of the skin and the hair are insufficient to determine the character of a race. The formation of the skull, the length, smoothness, curliness, crispness, and general disposition of the hair must be attended to. Geoffroy St. Hilaire comprises, as does Bory St. Vincent, all the white, yellow, brown, and red races under leiotrichi, straight-haired, and all the Negroes, Negritos, Hottentots, and Bushmen under the woolly-haired ulotrichi. The occurrence of crisp and straight hair depends on the whole organization.

Professor E. Haeckel ("History of Creation") thought that the conformation of the hair is nearly as important as the character of language in the classification of mankind. He accordingly assumes twelve species of man and their thirty-six races. Of these twelve species of man, the four lower species are characterized by the woolly nature of the hairs of their heads, every hair is flattened like a tape, and thus the

section is oval. These four species of wool-haired men (ulotrichi) may be reduced into two groups, "tuft-haired" and fleecy-haired. The hair on the head of the tuft-haired (lophocomi) Papuans and Hottentots grows in unequally-divided tufts. The woolly hair of the fleecy-haired men (eriocomi), on the other hand, in Caffres and Negroes grows equally all over the skin of the head. All ulotrichi, or woolly-haired men, have slanting teeth, and the color of their skin and hair is always dark. They are more like apes than the lissotrichi, or straight-haired men. No woolly-haired nation has ever had an important history. In the eight higher races comprised as straight-haired, the hair may be much frizzled in some, but never actually woolly; each separate hair is cylindrical, not like a tape, and hence its section is circular, not oval. The late Dr. Pruner Bey, in his interesting essay on human hair as a race character, found on examining by the aid of a microscope the transverse section of hairs that they were circular in smooth; oval, rather compressed, in curly hairs; and elliptical and much flattened in crisp hairs. The more the hair is flattened the greater its tendency to curl; the more it approaches the circular form the smoother and stiffer it becomes. Considering that the smoothness, stiffness, and crispness constitute some of the most persistent characters in the types of mankind, it is in his opinion not altogether an Utopian idea that the problem may be solved—"given a human hair, to determine the race to which the individual belongs from whom the hair has been taken."

But while fully admitting that the structure and transverse sections of the hair form a chief character in the classification of the human race, I consider it rather hazardous to construct upon this single feature a complete system of classification. It is only when the cranial structure coincides with that of the hair that a more satisfactory classification would be effected, otherwise the smooth-haired Australians must be accounted of the same race as the straight-haired Mongolians.

The character of the hair, especially that of the head, may be described as coarse, fine, smooth, straight, curly, waved, frizzly, crimped, or tufted. With reference to the classification of human races, the form of the hair is certainly of more importance than the color. The form of its transverse section is sometimes circular, sometimes elliptical. This much is ad-

mitted by all anthropologists, that in proportion to the flatness of the hair, especially if combined with great fineness, the greater will be its tendency to curl and become frizzly.

The curliness of human hair attains its maximum in the Negro. It is not merely curly, but the individual hairs are extremely fine, and the roots are much smaller and lie more superficially than in the other races. That this crispness does not depend solely on the heat of the climate is proved by the straight hair of races living in other parts of the tropics. The Esquimaux and the Greenlanders have black hair, as have also the inhabitants of Terra del Fuego.

Crisp hairs entwine themselves with one another more closely than those which are straight; hence Negro hairs are better for felting.

Among the variations of the human genus, there are some who, as regards the structure of their hair, present a very remarkable appearance. Such are for certain the Cafusos and the Papuans. The Cafusos, who are known to be descendants of an intermixture of the aborigines of South America with imported Negroes, present, as described by the German travellers Spix and Martius, a most striking appearance by the excessively long hair of their heads, which at the point is half-curled, and rises almost perpendicularly from the forehead about eighteen inches, thus forming a prodigious and very ugly natural peruke, which at first sight seems artificial. This conformation of the hair causes a resemblance of the Cafusos to the Papuans of New Guinea. These large bushy masses of woolly hair attracted the attention of early voyagers, such as Dampier, who called them "mop-headed." They are like the Cafusos or mixed races. They have neither the hair of the Negroes nor of the Malays, but hold a middle place between them. Their hair frizzles naturally, which gives to their head an unnatural circumference. They have very scanty beards. The Papuans are, as stated, chiefly remarkable for the peculiar growth of their hair, from which their name is derived, for papuwah or puapuah signify in the Malay language frizzled like wool. The growth on the head of these people, being very luxurious and crisp, forms a dense mop projecting from six to twelve inches from the skull. The hair of the Papuans has been generally described as growing in tufts, but Dr. Miklucho Maclay and Dr. A. B. Meger both state that the hair of the

Papuans is as evenly distributed on the scalp as in the case of the Europeans, and that the matting into tails is the result of the hair not being combed. In point of thickness of growth of hair the Papuans probably surpass all other nations, just as the North American Indians seem unrivalled in point of length of hair. Catlin ("North American Indians," Vol. I., p. 49) says that the hair of the Sioux or Dacotas reaches to the heels, and in the Crowheads it attained a length of ten feet seven inches.

The evidence in favor of the inheritance of the color of the skin applies equally not merely to the general color and texture of the hair, but to certain apparently tufting peculiarities in the disposition of the hair which reappear in the descendant.

Change of Color.—The influence of disease on the color of the hair is a demonstrated fact. Dr. Isoart narrates in the "Journal Complémentaire" that he had a patient whose hair was naturally exceedingly fair, but when she suffered from fever her hair became red; after her recovery the hair resumed its usual color. Alibert mentions the case of a lady who after a fever lost her beautiful fair hair, and that after her complete recovery the new crop was quite black. These and many other cases sufficiently prove that the secretion of the pigment in the hair is closely connected with the animal economy, and that the condition of the hair deserves more attention than has been hitherto bestowed upon it.

Anomalies of Coloration.—The hair may be without pigment at birth or may lose it afterward. Congenital defect of pigment is noticed in the hair and eyes of Albinos, also in some of the lower animals, white mice, cats, etc. Besides the absence of pigment there occur other anomalies. The hair may be lost and be replaced by a crop of different color, either darker or fairer. Richelot relates the case of a young lady whose hair during an attack of chlorosis became quite gray two inches from the root. The rest of the hair remained unaltered. A cure having been effected by the administration of iron, the hair grew up brown again. The result was that while the lower and upper ends of the hair were brown, the hair was in the middle along a distance of two inches quite gray. Green and blue hair generally originate from foreign coloring substances, and have chiefly been observed among workmen laboring in metal manufactories.

Spotted Hair—Speckled Hair.—Dr. Lieber, of Berlin (Hecker's "Lit. Aem.," 1828), records a most remarkable case of the discolorization of hair. Emily B., aged 16, with dark hair and dark skin, otherwise healthy, noticed at the period of puberty, on the left side of her face, a white stripe which crossed in an oblique direction the forehead, the eyelashes, and the cheeks; when the menstruation proceeded regularly the stripe disappeared, but the left eyelashes remained white, like those of a very old man. Before every menstruation the white hair increased both on the head and in the eyes, but disappeared when menstruation proceeded regularly. Dr. Vogel records the case of a man whose hair was gray on one side and black on the other.

Sudden Blanching.—A well-authenticated case of the sudden blanching of the hair is reported in Virchow's "Archiv" (April, 1866) by Dr. Landois and Dr. Lohmer. The patient, a compositor, aged 34, was admitted into the hospital July 9th, 1865, suffering from an attack of delirium tremens. A marked feature in the disease was the extreme terror when any person approached the patient. Nothing unusual had been observed up to the 11th, but on the morning of the 12th it was noticed with astonishment that the hair of the head had become quite gray in a single night. The patient was discharged September 7th, the hair remaining gray. The hairs of this patient were submitted to microscopical examination. The white hairs were found to contain a great number of air globules in the medulla and in the cortical substance, but the pigment was in every case preserved. In connection with this case, Dr. Landois quotes instances of blanching of the hair, in which each hair presented alternate rings of a white and brown color. A similar case was reported by Sir Erasmus Wilson to the Royal Society, on which occasion he presented a specimen of the hair of a boy aged 7, each hair presenting alternate rings of a white and brown color; Sir E. Wilson refrained from speculating upon the cause of the alteration of color. It should be stated that terror was very marked in Dr. Landois' case. In by far the great majority of recorded cases intense mental emotion was apparently connected with sudden blanching of the hair, but the mechanism of the change and how the air finds its way into the hair is far from being understood. It is more probable that the air globules are developed within.

Cases of Hair Electricity.—Among the other uses of the hair may be mentioned that it excretes electricity and perhaps other imponderable substances from the body, and absorbs other substances from the surrounding atmosphere. The electrical phenomena of the hair of some persons whose heads emit electric sparks in combing or brushing, and whose hair stands on end during electrization, are sufficiently known. Generally speaking, the more hair a man has the greater the accumulation of electricity. The hairs, in short, are excretory organs; hence their abrupt and untimely removal may in some cases have serious consequences.

Dark Hair.—Light hair seems gradually becoming less common and consequently more appreciated in England than it used to be. Dr. John Beddoe, of Clifton, has collected large materials on the color of the hair, and thinks it probable that the physical qualities of the race may be to some small extent moulded (we say it is, and that to a very large extent) by the action of conjugal as well as of natural selection. In order to test this hypothetical influence, he has thrown into the form of a table the color of the hair of 737 women, aged between 20 and 50, who came under his observation at the Bristol Royal Infirmary, and the deduction he made from the figures obtained was that the mass of the population does not sympathize with the preference given by painters and poets to fair hair; hence fewer of light-haired women than of dark-haired get married in that part of the kingdom. When Dr. Beddoe penned this article the rage for fair hair had not yet commenced, and the people in Gloucestershire and Somersetshire are on the whole a dark-haired race.

Color.—The opinion that the color of the hair depends entirely on the pigment in the medullary substance is, nevertheless, still adhered to by many observers, although it has been proved by Griffith, of London, Mandle, Henle, etc., that the supposed pigment molecules were chiefly minute air-vessels which fill the minute cellular spaces of the medullary substance. The color of the hair is thus ascertained to depend solely on the diffuse pigmentation of the cortical substance, no matter whether the medullary substance exists or not. If this be so, the cause of grayness is not due to the opacity of the cortical substance, preventing the visibility of the medullary pigment, but because of the disappearance of the diffuse

pigmentation of the cortical substance. The real cause of this disappearance is as yet unascertained. The medullary substance we know is not a constant constituent of the hair shaft. It is frequently absent in human hair. This is especially the case in light hair, especially those on the head. The absence of the medulla in the hair of new-born children whose hairs are shed is a certain fact. In short, the supposed black pigment is air. The medulla is not so frequently absent in the hair on other parts of the body. The hairs of the armpit appear reddish even in dark persons; this is probably due to the acids of the sweat. The hairs, owing to the action of the human acids, frequently turn red, as has been frequently noticed in the hair of persons exhumed after many years.

The coloring matter of the hair consists in part of two kinds of pigment, granular and diffused. The color of the hair is thus due partly to the imbeddal of granular pigment in and between the cells of the cortical fibres, and partly to the diffused pigment, which more or less saturates the cortical fibre cells. The papilla of the hair is probably the main spot where the pigment is produced. Another constituent of the color of the hair is the air contained in the air shaft and the medullary canal. Thus in senile canities in which the hair becomes gradually gray the pigment also gradually disappears, but in sudden grayness the pigment is found preserved, but the gray places show an abundant number of air-vessels both in the medullary substance and in the cortical layer.

Partial albinism is comparatively a rare affection, and but slightly touched upon in text-books. This affection was well known to the ancients. Celsus gave the name of vitiligo (from vitulus, a calf) to all affections presenting anomaly of pigmentation. Willan was the first who distinguished partial from complete vitiligo. Bärensprung, Simon, and Beigel have latterly treated of this affection. It was formerly believed that, apart from domestic and other animals, this affection was peculiar to the Negro races. Blumenbach and Sonnini gave descriptions of such piebald Negroes. Simon ("Deutsche Klinik," 1861), on the other hand, asserted that partial albinism occurred more frequently in the Caucasian race. Beigel speaks also of a semi-albinism of Negroes in whom some spots of the skin present an intermediate coloration between black and white. Bärensprung ("Deutsche Klinik," 1855) maintains that

partial albinism, of which he had observed six cases in the white race, is almost always congenital, though only noticed at a late period. Rayer, on the other hand, is of opinion that in Europeans, at all events, partial albinism is always acquired. The etiology of this acquired albinism is as little settled as the change of color of the hair, especially in the sudden blanching of it. The modern name of leucoderma is equivalent to the term of partial albinism, which has been ably and exhaustively described by Mr. Jonathan Hutchinson in his work on "Rare Diseases of the Skin." Alibert saw during the "reign of terror" a young man turning suddenly gray during the night preceding his decapitation by the guillotine. Of the Prince of Béarn, afterward Henri IV., it is said that during the Bartholomew night, having reposed on his hand for many hours in great anxiety, he found that the right part of his head hair and beard had become gray, an instance of partial albinism. That such sudden blanching is, as some will have it, caused by the action of morbid secretions on the outside of the hair is possible, but not quite probable. We known how by simply listening to a horrid tale we shudder, as is popularly said get a goose-skin, and feel a horripilation. Most abnormal and involuntary manifestations in the skin, such as blushing, growing pale, shuddering, depend partly, if not chiefly, on the sympathetic nerve. Terror is the chief cause in all cases of sudden blanching. Trousseau gives cases in which, from a neuralgia of the trigeminal nerve, the hair on that side had become gray. Labat ("Afrique occidentale") says Negroes suffering from long-lasting diseases become sometimes so pale that they can be scarcely distinguished from a southern European.

CHAPTER IV.

ALOPECIA.

ALOPECIA (from ἀλωπηξ, a fox, which animal is said to be subject to this affection) signifies the falling off or loss of hair, while calvities signifies baldness. Thus alopecia may be said to be the beginning or evolution of the disease, and calvities or baldness represents the accomplished fact. The lower animals afford us numerous instances of periodical losses and reacquisitions of hair and feathers. Animals with hair are said to shed their coats at certain seasons, while the feathered tribes are said to moult. In the human race the hair of the head falls to a slight degree in the summer and autumn.

The different forms of alopecia may be tabulated as follows:

Alopecia congenitalis.
Alopecia senilis.
Alopecia præcox.
Alopecia parasitica.
Alopecia somatica.
Alopecia follicularis.
Alopecia universalis.

Congenital Alopecia is an unusual condition. I have frequently seen children born with a scanty crop of hair, but never with an absolute absence of hair, and I should doubt such an occurrence. Those cases which have occurred under my own observation have been the children of parents who have lived in an unhealthy situation, have had their family rapidly, and the children have often got their teeth late, and their bones have been thin and soft.

The following case, from my notes, will afford a typical instance of what I mean:

A male child, aged 6 months, was brought to me for eczema of the groin and perineum. The child had on casual inspection absolute deficiency of hair, but on close examination small downy hairs could be seen here and there on the scalp, eyebrows, and external aspects of limbs. The condition

was one which had not given the mother any anxiety. Her other children had a fair crop of hair when born; this child was the seventh in ten years. It had a square head, large epiphyses, and night-sweating, cried when taken up, and had been much subject to bronchial and intestinal catarrh.

I saw this child again when 20 months old; the hair system was then fairly luxuriant.

Children will often be brought because they have a deficiency of hair in one spot. I have a child under observation at the present time with a patch on the occiput, where the scalp is occupied by a circle of hair which is short and stubby, not unlike ringworm. This spot is exactly where the pressure of the pillow is most severe on the skull, and my patient, now 12 months old, has been laid much on the back.

Dr. Wyndham Cottle relates, in his work on the hair, a curious instance of complete congenital alopecia, but he does not tell us for how long the patient remained under observation, or whether the hair grew at a later period of life. Rayer cites the case of a man with a congenital deficiency of hair, so that his cranium appeared completely bald. The man's father presented the same defect. Dr. Bauz (Stark's "Archiv") records the case of a family in which the son was congenitally bald.

Alopecia Senilis.—Senile baldness is of such frequent occurrence among men of an advanced age that it almost seems a normal condition of the male head. Let any one, at the meetings of our learned societies, or from the galleries of the House of Lords or Commons, look down upon the heads of the members of the assemblies, and he will be surprised at the number of shining pates. As a rule, the hairs are wanting over a space extending from the upper third or to the vertex, and laterally near to the middle of the parietal region. No satisfactory explanation has as yet been advanced why baldness, having arrived at a certain point, should be arrested in its advance, for while it denudes the portion of head wherein, it is assumed, the intellectual brain dwells, it spares the posterior portion of the skull.

The back of the head, the lower portion of the lateral regions of the skull, and the temple retain the hair longest. Frequently an anterior strip of hair remains at the upper

border of the forehead, and this growth is often ingeniously used by bald people to hide their deficiency.

The scalp thus deprived of hairs looks smooth, bright, and shining. It is smooth, because the hair has been removed; bright, because it has been frequently polished by the process of scrubbing; and shining, because in spite of the absence of hairs it is often oiled. The hair follicles in the early stages of baldness are perceptible; but when the disease has advanced they are only here and there visible. Where they are seen they are found to produce feeble wool-like hairs, called lanugo. It has been urged that the baldness of the crown is attributable to the wearing of head-gear which presses upon the blood-vessels and diminishes the supply to the regions which are stripped of hair. But it is more likely to be due to the hair being kept away from the light. Sailors, butchers, and others who go about without head-coverings are seldom bald. And I knew of an instance of baldness in a man who was completely restored after he had been sheep-farming in New Zealand, where he was in the habit of going the whole day without any hat or cap on.

Men are more frequently affected by loss of hair in old age than women. No explanation of this is known, but it may be due to their form of head-dress, which covers less of the scalp, exercises less pressure upon the blood-vessels, and by not covering so much of the scalp allows the light to have its full effect upon the unexposed portions. It cannot be due to their not devoting so much time to intellectual pursuits, as there is a very large number of deeply-learned persons, as well as common and dissipated people, whose hair grows luxuriantly; while many others who think but little, and live contentedly and unoppressed by care, lose their hair early in life.

The hairs in this form of baldness often turn gray before they are shed. It must, however, be understood that the alteration in color in no way leads to alopecia. There are plenty of old people with luxuriant hair of the most beautiful silver-gray. The hairs of the beard and other portions of the body do not fall out to any extent in senile baldness. In fact, a long white beard is often found in men whose pates are smooth and shiny.

The question as to what age we are justified in speaking of senile baldness may be answered as follows:

As a rule, baldness should not commence before the age of fifty. If it occurs before this age, it is either due to hereditary predisposition or else it is due to some removable cause, such as disease of the scalp, sebaceous follicles, the invasion of a cryptogam, or diseased blood.

The question as to the cause of senile baldness cannot be answered in any other way than by saying that it is pathological senility.

If we examine the scalp of an aged person who has been bald for some time, we shall discover a wasting of hair follicles, connective tissue, fat granules, and sebaceous follicles. The covering of the skull, in the bald situation, is then dry and shrivelled, and especially is this discoverable where the tension of the scalp is great—*i.e.*, at the vertex of the skull or over the sagittal sature. But if we examine the scalp of a person advanced in years whose baldness is commencing, we will find hair follicles in many stages of atrophy: some producing puny hairs, others shrivelled up. This condition not producing complete baldness, patients rejoice over the downy growth upon their head. They are inspired with false hopes; and especially so if they have been using hair restorers or colored and scented oil, and have believed in the string of laudations accompanying each bottle. At this stage of baldness the sebaceous follicles are sometimes abundant; and it is not unusual to find bald-headed persons with very greasy scalps. As the disease advances the hair follicles cease to produce any hair, and the papillæ, together with the follicles, actually shrivel.

These changes are simply the changes of declining life. They are changes of degeneration. The investigations of Sir William Gull and Dr. Sutton, undertaken to explain the association of granular kidney and general degeneration of tissue, proved conclusively that in advanced life the whole vascular area undergoes thickening of its coats, and eventually obliteration of the canals. And it is to this change that we must look for an explanation of the baldness which is associated with advancing life.

Alopecia senilis is not curable.

Alopecia Præcox.

This name indicates baldness coming on prematurely.

It may be said that baldness occurring in persons under the age of thirty belongs to this class.

They may be divided into two groups.

Firstly, those cases which are due to a disturbance of the nervous influence.

Secondly, those cases which occur in individuals congenitally disposed to the loss of hair. A common case of baldness from fright is reported in the "Gazette des Hôpitaux," No. 33, 1879. A girl, aged seventeen, who had always enjoyed good health, had one day a narrow escape from drowning, being crushed by a floor giving way beneath her. She was very much frightened, and the same night complained of headache and chills. The next morning she felt restless and had itching of the scalp. During the following days she steadily improved, with the exception of the itching. One day, on combing her hair, she noticed that it came out in great quantities. Three days later she was perfectly bald, and in two more days she lost every hair on her body. Her general health was good. The patient remained bald, and was still so when seen by the reporters ten years later. In one instance a patient of mine narrowly escaped being burnt to death, and in her case the hair of her head was nearly completely shed, but it grew again. Those cases which occur in one area, supplied by one particular nerve, show clearly how the hair may fail through aberration or alteration of nerve influence.

Thus Ruvaton mentions the case of a man in whom amaurosis of the right eye, as well as loss of color and shedding of the hair of the scalp, of the eyebrows and eyelids on the same side, resulted from a shock. Romberg saw bald patches develop on the head and great suffering from a trophic facial palsy on the affected side.

Cooper Todd reports a case in the "Lancet" for 1869, in which, in consequence of a concussion of the brain from a fall, hemiplegia and alopecia of the hair of the beard and of the head occurred. Also another case in which the hairs and nails were shed after the patient had been struck by lightning.

No satisfactory explanation can be given of these forms of

loss of hairs. In a later chapter we shall discuss the question of nerve influence on the color of the hair.

It is undoubtedly true, nevertheless, that the hair is not infrequently shed through the influence of the nervous system. The shedding occurs quickly, and in all the cases which have come under my observation, unless there has been an organic lesion of the brain and spinal cord, the hairs have grown as abundantly as ever.

Among the exciting causes of baldness are enumerated excesses *in Baccho et Venere*. Thus Gumer gives a long list of bald emperors and kings who had distinguished themselves by their dissipated habits—Tiberius, Claudius, Galba, Commodus, Henry III. of France, etc.

The form of baldness which is found in the second group of alopecia præcox is well expressed in the following case:

J. C., aged 25, is one of six children, four of whom are boys. He is the youngest. His father was bald prematurely at 24 years of age. Two of his brothers have lost their hair. He has now, from the occipital protuberance and extending forward, an absolutely bald pate. The skin looks shining, and very few hair follicles can be seen with a strong lens. He has a fair crop of curly, dark-colored hair above his ears and below the occipital protuberance, which hair is not in the least gray, neither does it come out easily. His eyebrows, axillary, and pubic hairs are strong and firmly planted, and he has a well-grown mustache. He has never had syphilis or any other blood disease, and with the exception of occasional attacks of gastritis, he is and always has been perfectly well. There is neither history nor evidence of skin affection in his family.

I could multiply such instances to any extent, as the state is a most common one.

I will relate the notes of one more case, which is full of interest and affords much room for speculation.

Mrs. S., from Balham, is 55 years of age. She is one of four children. They are all well. Her mother died at 88; she had luxuriant hair. Her father died aged 72; was partially bald. She was perfectly well until the last seven years, at which period of her life she had an alteration of her menstrual function, the periods ceasing suddenly after a great loss. Since

this she has got fatter, whiter, and weaker. She has great depression.

She is a large-framed woman, walks and talks slowly, answers questions very slowly. She has a stolid look. Her pupils are remarkably small and lazy. The whole subcutaneous tissue of the body seems hypertrophied, is dense, firm, and resisting; but it does not pit anywhere, excepting on her legs.

The joints of her fingers and toes have distinct lips, and are painful at certain times. She is sure that the weather and many kinds of food influence them. She has a constant noise in her head; it is like the noise made by a steam engine. This noise never leaves her. Her hearing and sight are normal. She has on her scalp a few long straggling hairs, but they grow at intervals, about eight or ten in a square inch. The hairs in other situations are normal. She lost her husband very suddenly, when her menstruation ceased, and she attributes her sufferings to this shock.

This is not a work which will enable me to enter into the discussion of myxœdema, on which the labors of Dr. Mahomed and others have so helped us, but I quote it as an instance of baldness in a woman who was free from any disease of blood or glands.

The growth of hair in women on the upper lip and chin, which occurs at what is known as the change of life, has been noticed from Shakespeare downward by general writers, but, so far as I know, it has not been observed by physicians. It is an acknowledged condition, as is the growth of adipose tissue which so often occurs in women between the ages of forty-five and fifty-five.

Alopecia Parasitica.

This little work not being a treatise on skin diseases, we can only notice such cutaneous affections as in their progress implicate the structure of the hair. Some cutaneous diseases are due either to an animal parasite or to the presence of a vegetable parasite. The former are called dermatozoa; the latter, dermatophyta.

The parasites which are formed in the interior of the body do not concern us here, nor those which merely affect the skin, such as the acarus or the different kinds of pediculi.

The following table, from the able work of Dr. McCall

Anderson, of Glasgow, is very useful, and embraces the varieties which we will now discuss:

I. Tinea favosa..... ... .Parasite, Achorion Schœnleini.
II. Tinea trichophytina.....Ringworm. Parasite, Trichophyton.
Varieties.—1. Tonsurans..... Ringworm of the head.
2. Circinata.....Ringworm of the body.
3. Sycosis.....Ringworm of the beard.
III. Tinea versicolor.....Chloasma. Parasite, Microsporon furfur.
IV. Tinea (?) decalvans.....(Alopecia areata). Parasite, Microsporon Audouini.

Tinea Favosa. Syn. Favus.

Tinea vera, by Terry; mycosis achorina, by Virchow.—The true nature of this disease seems scarcely to have been known to the Greek and Latin physicians, while the Arabs recognized it as a special malady.

In 1714 Turner proposed naïvely to divide all chronic skin diseases into two classes. That class affecting the body was included under the common name of herpes, that affecting the scalp under tinea. Willan, finding the term tinea much too vague, substituted that of porrigo, of which he admitted two varieties, porrigo favosa and porrigo scutulata, which Bateman, the pupil of Willan, further subdivided into six varieties. This system prevailed in England and mostly on the Continent until in 1839 Schoenlein discerned in the scales of favus a vegetable cryptogam, so that favus was now considered a parasitic disease as much as itch. Since this date numerous pages have been written, both in this country and abroad, still a great deal of diversity of opinion exists with regard to the parasitic diseases of the skin. Some look upon the cryptogams as the cause of the disease, others as the consequence. There are others again, in England especially, who hold that there is only one vegetable parasite which produces different manifestations according to the situation in which it grows. They have considered that the Microsporon Audouini represented the cryptogam in its primitive state, while the fungus of favus was the fully-developed plant. The majority of dermatologists, however, recognize favus (or honeycomb ringworm) as a distinct species. The rapidity with which it grows, the typical and depressed cups, the mouse or apple chamber odor, the way in which it dips below the skin and clings to a hair, show it is a disease *sui generis* as much as is

chloasma. This species of favus does not take root easily. I have tried once to cultivate a favus cup, but although the plant was allowed to remain in the skin for four days, no result ensued. The example quoted by Anderson (p. 27) on skin diseases proves that the disease is capable of being transplanted, but that in some skins at least it does not take root. The lightness of the sporules has been ascertained by the beautiful experiments of Bazin, who collected particles of favus crust in a basin of iced water placed fifty centimetres from a patient with this disease. The patient sat in a direct line with the draught out of this basin, and was asked to frequently scratch his head, the result being that favus cups were detached, carried in the current of air, condensed, and deposited in the iced water. Hebra inclines to the view that the various shapes of parasitic diseases are rather due to the development of the plant at the time the observation is made.

Against this view is the striking clinical evidence that one does not meet with patients who have chloasma, common ringworm of the body and scalp, sycosis, and favus. Individual instances are recorded where two or more have existed at the same time, but surely it is easier to believe how in these instances there have been two cryptogams planted and growing together. Dirt seems to be the most favorable condition to the growth of the favus germs, but it is not at all essential to their production. It is certainly rare to meet with it in those who are cleanly in their habits and whose general health is good. This *a priori* is what the experiments teach. That it is necessary for the production of favus that the spores and soil remain for some time in apposition with the skin, and in those who know soap but seldom, exactly this state exists. Many dermatologists, and chief among them Duvergie, believe in the spontaneous generation of parasites in the bodies of the poor and dirty. He and those who think with him support this view by the fact that parasitic affections sometimes get well in patients who are put under good hygienic conditions and ordinary internal medicine. Doubtless such cases do occur. But that it is cause and effect is another instance of loose reasoning which makes all therapeutics so much the child of falsity. Those of his school argue that these cryptogams develop in and around hair follicles. It would be just as rational to state that beds develop bugs.

It does appear clear to one's mind that floating in the atmosphere are germs of disease, and that these germs want a suitable habitation. That this habitation, in the case of vegetable and animal cutaneous parasites, is often the product of dirtiness is undeniable, and finding this habitation, there germs, or spores, or plants will settle down and grow. The ink I am now using may be left undisturbed for a few days, and will be covered by a minute plant. To argue that this plant came from the ink is simply advocating the theory of those who deny the parasitic origin of favus and allied maladies.

Symptoms and Course of Favus.

The seat of favus is generally the scalp, but it may attack any portion of the body where the hair grows. In a gentleman who is now under my observation the disease commenced at the back of the neck, where I have seen ringworm commence in several instances, probably by sitting on a chair which has on the back the favus spore, and these are brought in contact with the hairs. At first the disease consists of yellow scabs, looking like glue. These will be found on minute examination to be pierced by a hair. They can be detached and will be found to run up and down like the blocks used in the rigging of a ship. They are about the size of a pin's head. These bodies consist of masses of spores which develop in the mouth of the hair follicle. The skin around will be found slightly raised in places, and the centre of the cup depressed. As the masses of favus grow, they coalesce until they form a complete crust on the scalp. If, however, the favus and pits are separate, a curious formation takes place, which consists of rounds at first concave, afterward convex; this dry sulphur-colored scab consisting of a structureless capsule and of innumerable spores and branches. Gradually, as the disease advances, the hair follicles become overgrown by the fungi. The growth of the hair is interfered with, it breaks off short, becomes dry and brittle, and falls out. When these scabs detach themselves, the skin, from pressure exercised by the cup halves, becomes atrophied, and is never repaired. The hair but seldom grows again upon the situations of the disease, and the papillæ having shared in the general atrophy, produce afterward a very poor and thin layer of epithelium, and for the rest of the patient's life these remain

upon the head, bald, depressed spots. The growth of the fungus, together with the irritation caused by the parasite which finds here a suitable habitation, often produce a great deal of inflammation of the scalp. It is not always easy to distinguish between the scabs of eczema of the scalp and a favus cup, especially when the two are combined. Generally, I believe always, a favus scab can be removed without pulling the epidermis beneath it, while the scales of eczema leave behind excoriation. Favus attacks the head, as it has been said, more frequently than any other part. It may and does occur wherever there are hairs. Next in frequency to the scalp I have seen favus of the whiskers, mustache, and back, or in any situation where the plant is most likely to find an opportunity of growing.

Favus is a disease met with commonly among the lower animals, and there is every reason for believing that the domestic cat, which is frequently affected with the disease, often communicates it to the human being. An examination of the hairs in cases of favus with a low power even demonstrates the existence of the fungus. Garlands of spores will be seen projecting from the hair like festoons, while many and separate spores can be seen splitting up the fibres of the hair. Favus attacks at the same time the nails, when it is known as favus unguium, a most intractable disease. It will also attack in rare instances the epidermis, when it is known as favus epidermicus; when such is the case the mass of spots becomes hard, and in a few weeks falls off, thus curing the disease. It is interesting to watch a case of favus in any one who contracts in any way specific blood disease. In Fulwood's Rents, Holborn, a dirty court, I had an opportunity of watching two children who had typical favus of the head and scarlet fever, and with all its horrible, disgusting companions. During the height of the scarlet fever the disease appeared to fade. The lice multiplied with frightful rapidity, but when the fever had passed the malady flourished as luxuriantly as ever.

The diseases most likely to be confounded with favus of the scalp are psoriasis, impetigo capitis, and ringworm of the scalp, but if it is borne in mind that the crusts of psoriasis are of a dirty chalk color, are distinctly raised above the surface, and are always associated with psoriasis elsewhere, the distinction is easy, while in impetigo capitis the scabs are more

uneven, more difficult to detach, and leave the epidermis abraded beneath them. The microscope will at once settle the difficulty.

Tinea Tonsurans.

Syn. Herpes tonsurans. Trichophytosis furfuraceus. Porrigo scutulata. Common ringworm. The Greeks described the pustule scars in the scalp under the name of *αχωρες*; the Latins preserved the name of achores. The word was probably given to diseases on account of the ravages produced by them in hair as a moth on fur. Almost every dermatologist has produced his own classification and specified a different nomenclature. To obviate the difficulty and confusion, many physicians—wisely, I think—would confine the term tinea to diseases affecting the hairs. There is no doubt that ringworm of the head is a highly contagious disease. In many cases it may be determined by careful inquiry that the disease is transmitted to the human being, but that its transmission takes place between man and beasts. I have now under observation a groom with well-marked tinea of his scalp and arms. He brought to me some hairs from a horse which I saw. These hairs were infested by a cryptogam which in no way differed from that which I found among his own hair. Much discussion has taken place as to the identity of the cryptogamic plants which are found in ringworm, sycosis, and alopecia, and much confusion has ensued owing to these discussions. The clinical testimony points to the fact that ringworm of the body and ringworm of the scalp are due to one and the same spore, because it is common to find patients with both on their bodies at the same time, and I have noticed on more than one occasion one segment of the circle on the scalp and the other on the neck. But hitherto I have not seen sycosis of the beard in the same individual with the ringworm of either the body or the head. Neither have I seen alopecia areata in the same subject as the other tineæ. The microscope reveals in all a form of plant-life which is not, I grant, contra-distinguished, but I do not care to base my judgment on this investigation alone. The broad lines of demarcation in clinical medicine help us more than the minute details, useful as the latter are. We must use a shovel sometimes, and not always a teaspoon.

Symptoms and Course.

The different appearances presented by ringworm of the scalp are due to the different degrees of inflammation set up in the skin and subcutaneous tissue by the parasite. Thus in mild cases of the disease we at first notice round spots as large as a sixpence, which are covered with short broken hairs and dirty, chalky-looking scabs. These will spread, and if several occur in the scalp at the same time (which is often the case) they will run together and form large and irregular patches, which even extend to more than the size of a crown. These patches are always more or less round. At first it is difficult to recognize, as it only consists of a small erythematous patch, and the hairs are not affected; but as the epidermis becomes heaped up and the hairs present the broken ends, looking like cocoanut matting, the disease is easily recognized. There is very slight irritation associated with ringworm. Sometimes, in those who have thin, fair skins, vesicles form around the circumference of the ringworm, but this is not universally the case. In others the inflammation runs into suppurative processes, and then the epidermis is raised, red, and tender, while pus can be seen oozing out of the follicles. When this degree of inflammation is set up the condition is known as kerion, the suppurative process set up by the parasite destroys future development, and the disease spontaneously subsides. But in this case it will be found that so severe has been the inflammation that permanent baldness results, and the patient has left depressed, shining patches of baldness, which do not again grow hairs, for the simple reason that the hair papillæ are destroyed. The cure of ringworm by parasiticides strong enough to produce suppurating inflammation is often followed by a like unsatisfactory result. When the patches of ringworm are not inflamed they are of various colors, agreeing with the complexion of the sufferer. The hairs lack lustre over the diseased patches and eventually fall out. The disease may grow on any part of the scalp. Generally they are found over the occipital, not often the parietal bone.

If permitted to run its course, it may go on indefinitely. I have known it to exist for five years. The disease attacks fair children more than dark, is very unusual after the age of

puberty, and is scarcely ever seen in the adult. It is liable to attack all classes, rich as well as poor. Upon microscopical examination the roots of the hair are found to be split up like a horse's tail, and between the hairs are found an innumerable number of spores, which spread into the shaft in wreaths.

Alopecia Areata.

Syn. Area Celsi. Alopecia circumaptis. Porrigo decalvans. Tinea decalvans.—This disease has been a bone of contention for many years, described by Celsus ("De Areis," Lib. VI., c. 49) under the name of area, and confounded since his time with ringworm, and all other conditions which often cause or leave, as a result of their ravages, bald patches on the scalp. A clear estimate of this very marked malady can only be obtained by observing that by alopecia areata we mean a contagious disease which occurs in all sexes and in all constitutions, preferring the middle-aged, commencing suddenly, without warning, and being manifested by the occurrence of round patches of absolute baldness, which patches show a preference for the posterior part of the scalp, but commonly occur on the parietal regions. The hairs around these patches are firmly implanted, and retain their lustre, their color, and their strength. These patches never spread beyond a certain circumference. They may occur at the same time, may run into each other, and produce extensive baldness. These patches are not limited to the scalp, but may attack the whiskers, eyebrows, or mustache, but in no case do they occur with anything like true symmetry. The hairs on other parts of the body do not fall out during the attack, neither does the general health suffer. The conditions which have been most often confounded with alopecia areata have been the remnant of bald patches which are frequently the sequel of lupus erythematosis of the scalp; eczema, or tinea tonsurans, where suppuration has occurred, or where the disease has been too vigorously treated; or burns, or any other pathological process which destroyed the hair papillæ, and also with the universal alopecia, described later, which attacks the whole hair system, which never recovers, and which is a constitutional disease. Alopecia areata begins, as a rule, in the head; sometimes several patches occur simultaneously. These patches have always

a clear margin; they are smooth, whiter than the surrounding skin, because the hairs are absent, and somewhat depressed below the level of the surrounding scalp. This is very obvious if the scalp is shaved. These bald patches are immediately surrounded by hairs, which come out easily or which fall out spontaneously, until a certain size is reached, when the disease stops. The disease is now obvious. But little irritation is felt, and some patients do not complain of any itching.

Sometimes the disease is arrested in one spot and is spreading from another centre, and it must be borne in mind that a patch which has been cured may suddenly be denuded of hair again, but as a general rule, by appropriate treatment the malady is cured in from nine to twelve months. From notes of my own taken by Mr. J. H. Gilbert, I find that out of 671 patients, 13 were the subjects of alopecia areata; 3 were females, 10 males. The oldest was 33 years of age, the youngest 6. They were all cured, and the average duration of their treatment was about seven months. The following case shows the great tendency of the disease to relapse:

L. H., aged 30, has on right of ligamentum nuchæ and on the left of the occipital protuberance circular, smooth, and absolutely bald patches. She says the first came when 15 years of age, and the hair has grown three times. The parent patch came eight months ago.

Out of my sixteen cases four of them told distinctly of contagion; in two of these cases I confirmed their statements by my own observation. The following cases are so applicable that I may be permitted to quote them:

G. H., aged 13. Has had bald patches on head for two years. She has now well-marked patches on outer side of the sagittal suture of alopecia areata.

J. H., her brother, aged 11. Has one patch of emphatically smooth ringworm on the left of the occipital protuberance.

A. H., aged 15. Had a similar patch on the left of her parting, but she is now quite well. They say they believe the disease came from using a strange comb.

Again:

P. C., aged 29. Has two patches of baldness on his skull,

which came without warning nine months since, when he was a clerk in a Paris bank. They are now well marked. His fellow-clerk, who worked at the same desk as himself, had a similar patch.

I could quote numerous other instances which point conclusively to the infectious nature of the malady from my private note-book, but I have preferred to use three which have been observed by others. The following case was under the care of another medical man as well as myself:

T. A., aged 14. Had a well-marked patch of alopecia areata over his right parietal bone. This was healed and cured in eight months in the ordinary manner. But unfortunately his cap was given away, and the boy who wore his cap contracted the disease.

Other writers—M. Gillette and others—have also quoted instances in which the clinical facts pointed to the contagious character of the disease. But the following, related by Dr. Hillier, is most conclusive:

"In a large parochial school at Hanwell, containing from 1,100 to 1,200 children of both sexes and from 6 to 14 years of age, a number of the children were found all at once to have on their heads patches of baldness quite smooth and pale. The patches varied in size from that of a fourpenny piece to an inch or more in diameter. In some children there was but one spot, in others two or three. The number of children affected was 43, and they were all girls from 7 to 14 years of age, who lived together. There was no case of the kind among the infants or among the boys, who occupied a separate part of the building. On more careful inquiry it was ascertained that one girl had been suffering from this disease of the scalp in an aggravated form for nearly six months, and had been allowed freely to associate with the others."

The microscopical evidence which we have found at the hospital has been wasted bulbs. Dr. McCall Anderson, in his work on skin diseases, gives a beautiful drawing of the spore and bulbs of the parasite found in this disease, and in some cases distinct evidence of the presence of mycelium and spores. The discovery and recognition of the low forms of plant-life

found in tinea is one marked by many errors and fraught with difficulty. It is only successfully accomplished by great patience, care, and practice. But to argue the non-contagious nature of a malady from an inability to discover the contagium verum is a line of argument which would, if applied to a syphilis in the acute specific fevers, abolish their infection entirely.

Arguments have been adduced to prove that alopecia areata is due to nerve action, or rather to the aberration of nerve action. Voigl has shown that the loss of hair in advanced age is limited to definite areas in the distribution of certain cutaneous nerves. By section of the sciatic nerve in rabbits, he found that on the part supplied by that nerve hair had not grown four months after he had operated, while in the healthy part the hair growth was normal. Romberg observed that in facial paralysis the hair was shed at the affected part. Von Bärensprung is of opinion that failure of nerve force is the chief cause of baldness.

Those who have taken refuge in the nerve origin of the malady appear to base their deductions on the belief that the disease is due to suspended innervation of a given area, but this will not account for the long-continued relapses of the malady, the numerous points from which it commences, and above all other objections, it cannot explain why more than one member of a family are attacked at or about the same time. I would sum up my remarks with the following propositions:

1st. Alopecia areata is a disease which is capable of being transmitted from one person to the other, but not with the same ease as tinea tonsurans.

2d. That the disease is caused by a contagium verum which is most difficult to discover.

3d. That it is a disease which only attacks those regions which are exposed to the air.

4th. That it is in no way a constitutional disease—*i.e.*, it is not influenced by internal remedies. It does not affect the general health and is not hereditary.

Sycosis, Mentagra, Chin-whelk.

Pliny ("Historia Naturalis") gives in the first chapter of his twenty-sixth book an account of an unknown disease which, according to his statement, was imported by a Roman knight

into Italy from Asia. It gave little or no pain, nor was it dangerous to life, but it caused such a deformity that death was preferable (sine dolore quidam; ac sine pernicie vitæ sed tanta fœditate, ut quæcumque mors preferenda esset). It was first called by the Greek name "lichenas," but afterward mentagra, on account of the chin being the chief seat of the affection. Women and—what certainly is remarkable—the lower orders and the middle classes were not attacked; but the nobles suffered severely, and spread the disease by their habit of kissing each other. Numbers of physicians came from Egypt for the sole purpose of combating the disease, and reaped a rich harvest. The treatment consisted mainly in the application of caustics, which, unless the skin was burnt down to the bone, did not prevent relapses. The description given by Pliny of its ravages and of its epidemic character is probably much exaggerated; but he mentions one characteristic of the affection which is even now peculiar to some of its forms, namely, its obstinacy and its liability to return unless radically cured.

Ælius Amidenus, a physician of the fifth century, relates in his "Tetrabiblos" that one Pamphilus treated at Rome the mentagra described by Pliny by a blistering ointment, consisting of oxide of copper, orpiment, hellebore, and cantharides; in fact, by a very powerful depilatory ointment.

Celsus gives in the sixth book of his "Treatise on Medicine" a pretty fair description of this disease. There is an ulcer, he says, which the Greeks call sycosis, because of its resemblance to a fig (the inner part of a ripe fig is probably meant), and he goes on to describe it with considerable minuteness. The first form (durum et rotundum), he says, is limited to the beard, and is probably true sycosis; but the other variety, which, he says, attacks the scalp, is moist and discharges freely offensive matter, is probably not a sycosis, but what we know as contagious porrigo. This species of tinea, called sycosis, or mentagra, is a disease of the beard, mustache, and whiskers; being most frequently found upon the skin, rarely affecting the scalp. It is characterized by spots or erythematous inflammation, involving the hair follicles, which patches frequently suppurate and give rise to considerable induration; and in some patients surrounding eczema is set up by the irritating influence of the discharge. The hairs which are at-

tacked are easily extracted, and the bulbs will be found shrivelled. There is seldom any difficulty, even with a low power, in demonstrating the presence of the microsporon, especially those wherein suppuration has not taken place. As the eruption increases the hair follicles become more involved, and many of them obliterated, so that if the disease be not checked, permanent scars and bald patches may be left. The rapidity with which this disease advances is in some cases surprising. It is not uncommon to find a patient who has a susceptible skin much irritated by a discharge from a catarrhal state of the nasal mucous membrane about his nostrils; and I have notes of three cases where in about twelve days a true sycosis has existed. There is another variety of malady, which is found among men engaged in shoeing or grooming horses. These animals are subject to a malady known as the "grease," which in reality is a parasitic disease attacking the heels of horses; and I have in my possession the portrait of a man who cut his lip while shaving, and who almost directly afterward shod a horse affected with this malady. In three days he consulted me, with a condition of his chin and beard in all respects like sycosis, and the hair follicles were invaded by the cryptogams. I may say this man got rapidly well under the treatment for sycosis.

Although we have enumerated sycosis among parasitic affections, we are bound to state that some of the principal dermatologists, both in this country and on the Continent, such as Wilson, Hebra, Bärensprung, and others, doubt the existence of a sycosis parasite. Hebra looks upon the disease as a local inflammation, having its seat in the hair follicles, whose origin, he adds, is altogether unknown to him, and dermatologists have been challenged to prove its cryptogamic origin by demonstration before a pathological society.

The challenge was accepted by McCall Anderson, who, at a meeting of the Medico-Chirurgical Society of Glasgow, held in January, 1868, demonstrated without a doubt that the disease was associated with a fungous growth attacking the hair follicles. The fact seems that, as regards its cause, there may be a parasitic variety and a non-parasitic; so that tinea sycosis should, as Tilbury Fox suggested, be confined to the parasitic variety as contradistinguished from scyosis. And probably these cases, which one so often meets with, which baffle

all our treatment, are not parasitic, but due to some directive agency governing the individual, such as scrofula or syphilis.

Alopecia Somatica.

The hair of the head is frequently shed in all the acute exanthemata, notably scarlet fever and small-pox. In these cases the alopecia occurs all over the scalp. The hairs seem to lose their hold of their follicles and drop out. Sometimes, but very seldom, the eyebrows and other hairy portions of the body are denuded. During the course of consumption the hairs always get much thinner and become long, straggling, and lie close to the head. This gives the very curiously white look which the scalp has in all wasting diseases, and which the laity recognize as a fatal omen. We need not be in the least anxious about these cases of loss of hair. The hairs fall out because the blood is of an unhealthy character: so soon as the normal state is restored the hairs will grow again as luxuriantly as ever, but sometimes of an altered color.

The cases on which we are often consulted, of young ladies who complain that their hair comes out in handfuls, are associated with the following train of symptoms: The patients tell their story, as a rule, with much confusion and tremor. Their pulse will be found to be beating rapidly. They are those who eat but little meat, scarcely take any exercise in the fresh air, and are always lazy, fretful, and weary. They suffer most from cold feet, backache, flatulence, and headache. Their bowels and menstruation are disturbed, and they form the great bulk of patients which frequent the rooms of the consultant. They are always anæmic, and they have many and varied manifestations of an erratic and wilful nervous system.

I do not include those cases of loss of hair which occur in women between forty and fifty in this group.

If we can gain the confidence of these patients, if we can prevail on them to go to bed early, to sleep eight hours only out of the twenty-four, to take an interest in life, to use their muscular frame by plenty of exercise in the open air, to eat a plain meat diet, to drink some beer with their meals, to avoid pastry, pickles, and sweets, much craved after by them, we shall scarcely ever need the action of the old pill of two grains

of carbonate of potass and two grains of granulated sulphate of iron; but it will help us much if we order a stimulating pomade for the scalp, such as are given at the end of the book.

Syphilitic Alopecia.

The hair is often shed to a slight extent in syphilis. It occurs as a rule about the eighth month, and varies much in degree. Out of seventy patients laboring under this disease, I find fifty-nine had more or less loss of hair, and it has supervened from the third to the ninth month in my cases. Syphilitic alopecia commences generally on the vertex of the head, which is denuded often very rapidly. It may then affect the whole scalp. The hairs lose their gloss, become dry, discolored, and are easily combed out. True syphilitic alopecia need not be accompanied by local phenomena of eruption or desquamation, as it evidently depends on a special modification of the general economy. It is rarely general, mostly being limited to the summit and anterior part of the head. The loss does, however, in some cases extend to the eyebrows and the beard. This kind of alopecia is mostly transient; the hair grows again after the syphilis has been combated by a rational treatment.

In the usual course of the disease the patient does not complain of the symptoms, and it is scarcely perceptible. In other instances there is almost complete denudation of the scalp. Wherever this occurs, my notes seem to show it is associated with a good deal of indiscretion and much deterioration of the general health. A lady has just died under my own care, with the following painful history: She was divorced from her husband because of alcoholic excess and infidelity on her part. She contracted syphilis in December, 1882. She came under my observation with acute pneumonia in July, 1883. She had then absolute baldness, excepting a few very straggling hairs. The eyebrows were shed, and many of the eyelashes, but the pubic and axillary hairs were intact. She had mucous tubercle in the buccal mucous membrane and the tonsils. The glandular system was universally enlarged. She had been suffering from delirium tremens before her seizure.

The lung became gangrenous, and she died fourteen days after the commencement of the pneumonia. How much the

syphilis contributed to the pneumonia it is not possible to say. I would only like to draw attention to the association of alcoholic excess, syphilis, and alopecia. I have frequently found those who have drunk heavily become bald early. The form of alopecia which occurs during the course of syphilis is not permanent, and must be met by appropriate constitutional treatment.

Alopecia Follicularis.

Those cases of loss of hair which occur in patients who have some other disease of the scalp are included in this group. The most common form of this disease is what is known as seborrhœa capillitii, or by the laity "dandruff," or "scurf." It is not a condition which occurs before the age of puberty. At first the patients complain of a good deal of itching of the scalp, which itching is worse when the head is hot; as after dancing or other violent exercise. "It prickles," the patient tells us. On examination of the skin on the head, especially at the summit of the crown, the head here is covered with a large quantity of scales, which in cleanly people are white, but in the dirty these scales become yellow. They are easily detached by scratching, and even fall off without friction. The collar of the coat will sometimes be almost covered by these scales of dead epithelium. The scalp beneath these scales is of an intensified color, but it is not weeping, as we see in eczema capitis. These scales sometimes accumulate and form a thick covering to a portion of the skull, which in one instance may crumble like chalk and in others contains more fatty matter, and mats the hairs together with a paste feeling greasy and looking like putty. This state is always associated with some loss of hair. But the milder condition may and does go on for many years without causing any anxiety until the hair begins to fall, as it always does in the course of time, and you now have added to the seborrhœa defluvium capillorum, a falling off of hair and later baldness. The patients notice the loss of hair at first very gradually, and it is only when well established that advice is sought.

The baldness is never sharp and sudden, as we find occurs in alopecia areata, but it is gradual, and the hair follicles produce for a long time downy hairs. In all instances the effect

of the unhealthy state of the scalp is very obvious, because the hairs which grow in these regions where the disease is not are strong, firm, and well planted.

This form of loss of hair is generally remediable, especially where the patients apply before the hairs are all shed. The treatment will be discussed in the chapter devoted to therapeutics. The hair is often lost from eczema, psoriasis, impetigo, and, as has been mentioned, from lupus erythematosis; and in many instances irremediably lost. The process of denudation always occurs by the disease interfering with the nutrition of the hair root, by exercising pressure, but in none of these diseases is the baldness sudden.

There is often great difficulty in differentiating seborrhœa, psoriasis of the scalp, eczema, and porrigo.

But if we remember that psoriasis occurs in well-defined patches, is not universal, and is always associated with the disease elsewhere, we have no difficulty. Eczema attacks a large area, is associated at some period of its career with oozing, and with itching and enlargement of lymphatic glands; porrigo of the scalp is a disease of childhood, and is associated with a large amount of pus and epithelial accumulation, and affects other portions of the skin, we shall avoid errors either in prognosis, diagnosis, or treatment.

Alopecia Universalis.

All writers on alopecia areata have described an advanced stage of the disease which seldom occurs, and in which instance not only the hair of the head and whiskers are attacked, but the covered portions of the body. Thus Dr. Carson records in the "Edinburgh Medical Journal," Vol. V., a remarkable case of complete depilation. The patient, aged 35, tall and muscular, and apparently free from any constitutional disease, noticed one day on shaving a bare spot on the right cheek. On going to have his hair cut the same day, the hairdresser called his attention to a circular bare spot on his occiput. From this day the respective bald spots enlarged, until he had not a hair left on his head, on his face, or on any other part of his body. During the progress of depilation the patient felt neither pain nor any inconvenience. The series of cases published by Mr. Hutchinson in the "British Medical

Journal" for 1858, contain instances where the baldness has spread to other regions than the face or scalp, notably No. 26, where the eyelids, lashes, beard, and anus were affected.

The late Mr. Startin alludes to similar instances in his lectures given in the year 1846.

Kaposi relates an instance of universal loss of hair in the case of a physician from Galicia, who shed the hairs of his head, eyebrows, eyelashes, beard, axillæ, and pubis. Other reference of allusion might be made from the works of dermatologists, but no useful purpose would be attained.

I was fortunate enough to exhibit the following most interesting case at the Pathological Society in 1882:

George Booker, aged 26, a carter from Sevenoaks, came on February 10th, 1881. He is a strong, very muscular, and cheerful man. His father and mother are both living. The father had a patch of scurvy on his right leg which used to itch very much (probably eczema), and his nails used to break off. Otherwise he was and is a very healthy man. He has brothers and sisters who, so far as he knows, are well and free from any skin disease. He gives us the following story: "Five years ago my baldness began in one patch in the middle of the back of my skull. Then others came on my head, and after these I got some white hairs and bald places on my eyebrows and whiskers. My sisters used to say I looked as if some one had thrown snow at me. These bald patches have gone on increasing until I am as you now see me. I am strong and well. I don't itch or feel cold. I have never had syphilis or a day's illness in my life that I can remember." On stripping him he appeared, on casual observation, to be absolutely bald, but on close inspection of the scalp, perfectly symmetrical patches of smooth and absolute baldness were found, which had convex margins, and beyond these convex margins were a few fine straggling hairs. There are a few straggling hairs on his upper lip. There is not a single eyelash left; on the external aspects of his arms and legs the hairs are fast disappearing, and they are disappearing in a regular symmetrical manner from centres which are readily seen and which have abruptly-defined margins. He has not more than a dozen hairs on his pubis or in the axillæ. In some situations, notably at the corners of his mouth and between the

scrotum and thighs, the bald and convex patches are not only devoid of hairs, but also of pigment, the patches standing out in bold relief, and being of a dead-white, like those which we see in leucoderma. He has no other evidence of skin disease, neither of having had syphilis. I have seen the patient every month until the present time, August, 1883, and I cannot discover any further effort at the growth of hair. He continues in good health.

The case I now quote also occurred in my hospital practice:

William Morgan, aged 22, a telegraphist from Mile End, has on the centre of each eyebrow a patch of absolute baldness. The hairs have also disappeared from the centre of his mustache, and there are two symmetrical patches of baldness on either side of his chin. The lines of demarcation are very distinct. The patches itched a good deal when they first came. The pubic hairs are falling out, but not from any perceptible centre. On the 17th November I made the following note: "On the extensor surface of the left arm is a well-defined patch of baldness. The right arm is not influenced. On the front of both thighs are true patches which are nearly devoid of hair, and on the anterior part of the hip are two absolutely bald patches. The hair of the head falls out a good deal. There is one bald patch just above the occiput, the size of a shilling. He has some symmetrical gray patches on his whiskers. There is no history of family skin affection."

Four other cases have come under my own observation during the last four years. Three have been women, and one man. The noticeable peculiarities in my patients were:—

The symmetrical progress of the malady.

The loss of pigment, as well as loss of hair, on some of the invaded patches.

The incurable nature of the condition.

I examined carefully the hairs in all my cases, but failed to discover any spores or mycelium.

Skin diseases, which advance in a symmetrical manner, are not due to parasitic causes or the affection of nerves. Those cases which I have ventured to distinguish from alopecia areata are in no way related to it. I look upon it as constitu-

tional, as much as I should psoriasis or leucoderma. In fact, I should argue that there is a very intimate connection between this condition and leucoderma, for in leucoderma we find the same symmetrical progression, the convex edges of the patches, the freedom from failing health, and the incurable nature of the malady.

I cannot help believing that these cases are much more common than is believed, or they have not often been described; probably those who suffer are anxious to hide their hairless state and do not seek advice.

For the same reason I have often discovered bald portions of skin when examining patients for other conditions. Such bald patches are especially found on the outer aspects of the limbs of those who have most friction of the clothes upon the skin; and it has appeared to me in some cases of prurigo, where the patients scratch themselves unmercifully, on the thighs especially, that the itching has been caused by the hairs being prevented from making their exit out of the mouths of the follicle by the pressure and friction of the clothes. If we examine these patients in a good light, we shall often discover rounded hard bodies, which feel like shot. These can be dug out easily, and when examined attentively will be found to contain an imprisoned hair, curled up like a watch-spring inside its follicle. I have under my care at the present time a street musician, who by a very ingenious contrivance is able to play upon several instruments at the same time; and in the movements which are necessary for him to accomplish his pandemoniary feat, he is exposed to much rubbing of the outer portions of his thighs and arms, and in these localities he has violent itching. The hairs here are all rubbed off short, and without any lens the curled-up hairs are easily discerned.

This form of prurigo is much worse in cold weather, and closely agrees with the disease which was described simultaneously by Mr. Hutchinson and Professor Dühring.

CHAPTER V.

CANITIES, PILOSIS, GRAYNESS OR HOARINESS OF THE HAIR.

THE loss of the color of the hair is due either to advanced age—the physiological cause, or disease, or in some instances it may be caused by strong mental emotions, or it is an inherited tendency. The time of the appearance of that unwelcome visitor, the first gray hair, depends upon numerous circumstances. In most cases the gray hairs make their appearance singly, and the bleaching is first noticed at the root. Those who are becoming gray always show their grayness more after being cropped, because the black ends being cut off, the gray roots at once stand out more clearly defined. This is very apparent in horses after they have been clipped or singed during the winter months. There is no doubt that fat is the chief cause of the color of the hair. This fat is equally distributed upon the cortex of the hair; alkaline substances dissolve the grease and discolor the hair. This is why strong potash waters make the hair light-colored; and this is why fatty substances, such as oil or pomatum, render it a little more colored. The presence of air has been clearly demonstrated in the hair by Kölliker. Dark hair contains very little air; light hair a good deal.

ETIOLOGY OF CANITIES.

We have seen that, according to the prevalent opinion of anatomists and physiologists, the blanching of the hair is chiefly due to the disappearance of the dark pigment which is formed and carried into the hair from the papilla at the bottom of the hair sac. Pfaff entirely dissents from this opinion, however plausible it may appear. He found, on examining many white human hairs under the microscope, the medullary substance well filled with dark pigment cells. But how, it

may be asked, can a hair filled with dark pigment cells look white? Simply because the cortical substance of the hair is so dense that the pigment cells do not show as before. In flaxen, light-colored hair the light passes through the cortical substance; in white hair the cortical substance reflects the light. So that it is this cortical substance which has undergone a change, as it now reflects the light, like thick frosted glass, while formerly, when the hair appeared of a darker color, the light was allowed to pass. The pigment often disappears entirely in very advanced age, but in the gray hairs of young persons the pigment of the medullary substance will be found in many instances to be unchanged. But just as there are gray in perfectly white hairs with dark pigment cells, so there are dark hairs without any pigment cells whatever. On examining red hairs closely it will be found that on the epithelial layer being scraped off, the cortical substance shows a reddish tint. For this reason there are perfectly red hairs entirely wanting red pigment in the medullary substance. Brown hair consists in every part of a light brown horny mass; black hair of a faint yellow horny mass; and only white hair shows, with the exception of the medullary substance, a perfect colorlessness of the horny substance.

We can easily ascertain the correctness of the observation, which runs counter to that contained in nearly all the manuals of physiology with reference to the colorlessness of the epithelial layer and the horny fibres of the cortical substance of the hair, by bleaching a human hair in chlorine gas. Chlorine soon deprives the epithelial layer and the cortical substance of its color, and the brown pigment in the medullary substance remains unaltered. Nevertheless, after a short action of the chlorine the hair appears of a bright yellow, and after a longer action quite white; but the chlorine has only taken up the color of the horny mass of the epithelial layer and of the cortical substance. Among the remote causes of grayness must be first mentioned heredity. Numerous instances of this kind are cited by ancient authors. One writes: "Grayness is a sign of gentle blood." It is, moreover, asserted that children of aged parents become sooner gray. Tarquin was born with gray hair. Seneca is asserted to have received his name from the same circumstance. It was formerly believed that such as become gray in early age die a premature death. Daily

experience shows that there is no foundation for such a belief. I know of a family, all of whom became gray at twenty-one, but they have all lived to an advanced life. Voigt, Zeiler, and Plenk quote similar instances. Even trifling peculiarities in the disposition of the hair reappear in descendants. Mr. Hutchinson told me of a similar instance, and I have in my note-book several cases, all of which have been inherited: all have been in locks. The hoariness of the aged usually begins at the temple, whence it gradually spreads to the whole of the hair. The coloring matter is no longer provided in the same quantity, or is wholly withheld. Grayness in tufts is often noticed in the head and beard owing to some local affection of the skin. Hairs which grow on scars are usually white. The grayness of the hair is normally a very slow process. The gray hairs are at first very few, but gradually they multiply. In the great majority of cases men do not become gray before they are forty. Women retain the color of theirs to a later period. The nervous influence upon the hair, whether as regards baldness or grayness, is abundantly proved. Dr. Anstie (Reynolds' "System of Medicine") writes that after an attack of facial neuralgia he noticed that the hair of the eyebrow was whitened, and that gray hair was thickly strewn over the right side of the head for some time after the attack. Sir James Paget tells us in his lectures on "Surgical Pathology," p. 31: "No tissue, indeed, seems to be wholly exempt from the influence of the nervous force on its nutrition. In the cuticle it is manifest; and for its influence in acting, even through a considerable distance, I may mention a case which is also in near relation to those in which the hair grows quickly gray in mental anguish. A lady who is subject to attacks of what are called nervous headaches finds, in the morning after such an one, that some patches of her hair are white as if powdered with starch. The change is effected in a night, and in a few days after the hairs gradually regain their dark color." This extract leads us to the discussion of sudden blanching of the hair. Sir Thomas More is said to have become gray in a single night after being condemned to death. Lemnius relates the case of a young man whose hair and beard became gray in a single night after being sentenced to death, and who was so altered in appearance that no one could believe that he was the same person, for which reason the em-

peror pardoned him. Thomas Campanella saw a monk at Rome named Ubipertus, who had been elected Bishop of Ratzeburg, but he was too young for the office. He went to Rome to obtain a dispensation from the pope, but being refused, became quite gray during the following night, so that the pope could not recognize him at first, but gave him the dispensation, saying: "Quem evidenti signa Deus probasset!—God had proved him by an evident sign." Shipwrecked persons have sometimes become gray in a short time, from fright. Henri IV. is said to have become gray within twenty-four hours about the time of St. Bartholomew's night. The story of Marie Antoinette, of Byron's Prisoner of Chillon, and Diana of Poitiers, are well known. The cases are so numerous of care and anxiety giving rise to gray hair that it has become proverbial.

> Cura facit canos
> Quamvis homo non habet annos.
>
> Although a man be not in years,
> Gray hair on his head soon appears.

Dr. G. Vogel says of himself that when he lost his beloved wife he became gray in a single night, in his thirtieth year. We all remember Shakespeare's saying, "Worcester is stolen away to-night; thy father's beard is turned white with the news" (Henry IV., 2d scene, iv.). I have seen a man suffering from delirium tremens whose hair turned gray after a violent fit of passion lasting several hours. It is not only the hair which is influenced so much by the nervous system. The blanching of the skin and blushing during anger are parallel processes. Young children become incontinent frequently when frightened. Dogs pass urine frequently when thrashed. The secretion of the liver appears to be much under the influence of the emotions. One of the prisons in London caught fire some years ago, and it was doubtful whether the outer wall would not tumble down. The fear of this had such an influence upon three of the warders that they became distinctly jaundiced a short time afterward. Numerous theories have been advanced to account for the rapid turning gray of the hair during violent emotion. It has been argued that the acidity of the sweat blanches the hair, but it would appear to me more probable that the whitening is induced by the action

of the muscular fibres of the hair and sebaceous follicles. But the modus operandi has yet to be explained. We know that the condition of the nervous system influences the glands and their secretions. We know that there is a connection between the secretion of the sebaceous glands and the color of the skin. Is it, then, too much to say that the venous disturbance arrests the secretion of the fatty matter? Haller, as is well known, questioned the truth of all cases of sudden grayness; but Bishop says that he has himself seen six, if not more, such cases. Fright, we know well, causes the hair to stand upright, and painters have been wont to depict standing hair in order to express terror.

CHAPTER VI.

CRINAL ABNORMITIES.

Plica Polonica and some other Affections of the Hair.

This disease of the hair, or rather, as we believe, of the skin, is at present confined to so comparatively small a territory that it is not surprising that it is so little known. It has many names on the Continent, but none in English (unless we call it "elf locks"), if this affection was known in Shakespeare's time (Romeo and Juliet). The hairs of the patient are matted and glued together by a quantity of secretion from some obvious disease of the scalp, such as eczema; and when the secretion is allowed to accumulate, it becomes the habitation of lice and various forms of vegetable life, so that it is not a disease *sui generis*. It is often endemic in Poland, Russia, and Hungary, but has seldom been described by English writers. We sometimes see in this country a disease of matted hair, called by the French tentrage—*i.e.*, felted hair. In this state the hairs become so matted by negligence that they can scarcely be separated by combing. In fact, when this condition is met with, the quickest mode of bringing the hair to its normal state is to have the scalp shorn, when, with proper care, the new hair will be normal, as the bulbs are not affected.

Expansions, Splitting of the Hairs.

In many diseased conditions of the scalp a casual observation will show the hair does not terminate in a fine blunt point, or in a cut surface produced by the barber's shears, but that the extremity is split up. This splitting occurs only in a few of the hairs, and it will be found that these are the longest and probably the oldest. If the examination is conducted by a lens of moderate magnifying power we shall probably find

uniform dilatation of the shaft, and as the condition advances the uniform swelling disintegrates and the cortical substance of the hair is split up; yet as the upper and lower ends of the shaft still cohere, the split up actual substance becomes interlaced like the stretched fingers of two opposed hands.

These hairs having lost their natural elasticity do not yield when bent, but form an acute angle, and it will easily be understood how it is that the hair when exposed to combing and brushing becomes broken and fissiated. If we also remember that there are several of these nodules in the hair shaft, we shall have a good description of the phenomenon which Kaposi has dignified with the name trichorrhexis nodosa.

The hair of the beard is usually the seat of this affection.

It must not be understood that we are of the opinion that all hairs which are split at their extremity into a mere film have always present nodes in their shaft, because it is found that on almost any scalp a few hairs can be found with split film, and it will be further found that such hairs sit loosely in their follicles, and their roots look old and shrivelled, doubtless the fissure developed at the time when the hair was first growing, and as it gradually got further from the seat of the nutrient plasm the films lost some or part of the cement substance and became fissured like a broom.

The cause of this condition is still *sub judice.*

Bärensprung has described and figured a fungus connected with this abnormal state and has designated it "mycosis circinata." We have not been able to corroborate his conclusions. Rather should we believe it is a local manifestation of a general hardening and advancing brittleness of all the epitheline structures, because it will be found that in all cases of brittleness of hairs there is *pari passu* a corresponding splitting of nails and degeneration of teeth, the structures which are prototypes of the hair; and it will be found that in all such cases the body hairs are dry, lustreless, and sometimes nodular.

Feather Disease, or Phagmesis of the Hair.

There are a few instances recorded of reproduction of feathers instead of hairs in man. At Maccomp, in the county of Cork, a couple of black rabbits have been exhibited with feathers instead of hair. In 1831 there was exhibited at

Bremen a boy whose head was covered with feathers instead of hair. The case is recorded in "Bäuerle's Magazine" for 1831.

Ringed Hairs.

Sir Erasmus Wilson has reported some cases of ringed hair —*i.e.*, hairs which have a black ring and then one white throughout the texture of the hair. The following case, which came under my own notice, demonstrates the possibility of the occurrence: J. Casper, a young man aged 20, consulted me for gray hairs. On looking carefully at the hairs by transmitted light, distinct, well-defined rings could be seen throughout the entire length of some, but not all the hairs of the scalp. He had been a very delicate boy, and suffered many illnesses. His scalp was supple, moist, and healthy, and the hairs were fairly implanted. He had on his nails a series of transverse white lines which occupied all the nails in his hands, exactly in the same way as those described by Dr. Wilks and Dr. Langdon Down. In other respects he did not present any disease. I am quite prepared to admit that no rational explanation has occurred to my mind which will account for the condition. The series of illnesses which he had passed through may so have influenced the disposition of pigment that the rings would in some way be found to be conditions of ill health which had preceded this state. I unfortunately lost sight of my patient, but I was inclined to believe that as age advanced, and if his health improved, the ringed appearance would cease.

Cosmetics.

In the previous edition of this work I did not treat of this subject, believing that it is not the province of physicians to lend themselves to those who would often abolish the grayness which add so much to the dignity and beauty of old age. Since this date, however, I have seen so many damaged scalps and hairs through using the numerous dyes, etc., etc., that I have endeavored to treat the subject so as to warn those who are desirous of abolishing the natural attributes of old age. No doubt the wish to enjoy perpetual youth and the desire to improve and beautify the surface of the body are not only the

most predominant, but pardonable ideas in mankind. Cosmetics formed among the ancients a branch, and whole volumes might be filled with the mere titles of the treatises published by the Greeks and Romans, but especially by the court physicians, on cosmetics. The progress of chemistry has much simplified the subject, and has enlightened us as regards the dangers of making up the recommended preparations. As a general rule, all such preparations as contain metallic oxides or mineral acids should be viewed with suspicion. Every cosmetic which is kept a secret, in whatever form it may be manufactured, will in most cases be found fraudulently inert or injurious to the general health. Let no one imagine that it is possible to improve the skin permanently without attending to the purity of the liquids which circulate throughout it. There subsists an intimate relation between our internal and external organs. One of the earliest authors who has treated of cosmetics was Crito, a Greek physician of the time of Trajan. His work, which included cosmetics, consisted of four books. Excepting what are gathered from the writings of Galen and Celsus, little has reached us of his work. A recipe is ascribed to this author, by means of which Helena is said to have acquired that dangerous beauty which led to the destruction of Troy, at which time she must have been an elderly lady. The recipe consisted of the yolk of an egg and gum benzoin, which when applied would certainly render the skin smooth.

Hairdressers and Barbers of the Ancients.

The business of hairdressers and barbers among the ancients was a far more important one than among us, since they never had either combs or proper scissors in their hands. They were thus compelled to pass their early hours in the barbers' establishments (tonsilites), which were most frequently filled with idlers and gossips. Rich people certainly possessed the necessary implements and kept slaves for the purposes of the toilette. The tonsor, or as in vulgar language he was called the barbatorius, usually asked, "How do you have your hair cut?" For there were at least five modes of doing so. They generally used only one knife, sometimes two, which were disposed so as to form scissors. These tonsors also cut the nails, hence the "ad unguam factus homo" of Horace.

Hair Cosmetics.

Advertisements for restoring the hair which has fallen off. The impudence of the advertisers is only matched by the credulity of the dupes. The best of their nostrums are those which contain nothing deleterious, and which are little more than the ordinary fats and oils colored and scented. The art of hair-dyeing and the embellishment of the hair was cultivated largely by the ancient Romans. Pliny cites a vast number for darkening the hair. They used goose fat, St. John's wort, myrtle, some of the peel of onions, etc. To prevent the hair turning gray, they used a liniment composed of the ashes of earth worms and oil, and bear's grease. The satirists did not fail to castigate the attempts of their time to conceal the ravages of years. Thus Tibullus (Lib I., Eleg. VIII., v. 43) has it—

> "Coma tum mutatur, ut annos
> Dissimulet; viridi cortice tincta nucis."

"You hide your age by dyeing the hair with the green rind of the walnut."

The women dyed and raddled (rutilatæ comæ) their hair and eyebrows. This dyeing of the hair sometimes brought its just reward. Thus we are told by Suidas (L. III. 43) that Philip, the father of Alexander, observing that one of his friends, named Antipater, whom he had appointed one of the chief magistrates, dyed his hair and his beard, removed him from office, saying that a man who is not sincere about his hair was unworthy of being trusted in what he had to do.

"Dicens, in capillis infidum, in rebus agendis fide dignum esse ne puta."

Soap was sometimes used by the Gauls for producing a reddish hair. Hair-dyeing, although in by-gone days a branch of the medical art, is now entirely in the hands of the perfumer and hairdresser, and it is remarkable how little attention English practitioners pay to hair affections. Very recently a surgeon applied to me for a hair dye which would not damage the hair in any way. It is only fair to state that this dye was required for a patient, and not for himself. He sent me at the same time a bottle which contained nitrate of

silver, and another wherein was made up a solution of lead, two powerful remedies, and both certainly capable of damaging the hairs and scalp and also of producing metallic poisoning. There are, unfortunately, many dangerous dyes on sale. Most of them, however, no matter how romantically called, are simply so many solutions of lead, mercury, silver, or copper, combined with a decomposing agent. Some of the hair restorers contain as much as a drachm of acetate of lead in half a pint of water. Of a more complicated nature, but equally injurious, are sulphur and iron or sulphur and lead. Iron and sulphur have also been used alternately. There is a remedy in repute among hair dyes whose action can certainly be checked, and with which the hair can be colored in different shades. It consists of two separate solutions, one containing nitrate of silver, the other containing a solution of potassium. The solutions are applied to the hair consecutively, reaction obviously depending on the combination of the silver and sulphur. These remedies require the most accurate chemical knowledge; otherwise strange results may be obtained, such as green hair. The natural antagonism which has always existed in the profession against the use of metallic hair dyes has caused a good deal of attention to be given to the discovery of a vegetable and non-injurious dye. Dr. Pollack, a court physician in Persia, introduced a vegetable hair dye which is much used by the Persians to produce a dark-blue color, which is much prized by them. The remedy consists of the dried henna plant and of powdered indigo. These powders are, of course, entirely applied to the scalp, and it does not appear that they will damage either the hair or scalp. But so much dexterity is required that most undesirable results are obtained by those who are not skilled in their use. The hair owes its property of being dyeable to its porosity, which seems greater than its structure would lead us to infer. Sulphur being one of its constituents, renders it liable to be darkened when combined with some mineral substance, such, for example, as lead and mercury. The depth of the shade of color will, in many cases, depend upon the quantity of sulphur present in the hair. Thus as red hair contains more sulphur than dark hair, the effect will be greater. Dr. McCall Anderson considers a lotion of hyposulphite of soda the most perfect hair dye. A few applications rendered the hair of the part which was before

bright red nearly jet-black, while neither the skin nor the clothing were stained. The red hair, as it grows, possesses of course the normal tint. The reason of the escape of the epidermis while the hair is dyed is that it contains no sulphur. The "golden yellow" color so much in fashion some years ago is produced by a solution of arsenic with a mordant of hydrosulphate of ammonia.

There are many instances on record of poisoning by cosmetics of a deleterious nature. Thus Horace Walpole ("Letters," Vol. III.) writes: "That pretty young woman, Lady Fortune, is at the point of death, like Coventry and others, killed by white lead."

Dr. George Johnson treated at King's College Hospital some ballet-dancers suffering from lead-poisoning by the use of flake white. John Hunter gives the case of a gentleman who exhibited symptoms of lead-poisoning from using a hair restorer to dye his gray hairs. The wash, when analyzed, proved to contain nearly three grains of lead in the form of acetate to the fluid ounce. Dr. A. S. Taylor ("Principles of Medical Jurisprudence") mentions a case of paralysis of the muscles of the neck from the use of a hair dye containing litharge.

I have myself seen two well-marked cases of colic, combined with a blue line on the gums, one in the case of a vain old *roué* who had for many years used a hair dye which contained acetate of lead; the other instance was in a patient who had dyed his mustache only.

It really comes to this, that all the dyes which have a mineral basis are not only injurious to the hair, but also to the scalp and the whole organism, and that all the vegetable extracts damage the hair. This I say with the fullest knowledge of the contrary statements made by the manufacturers of the many dyes; and as I said at the commencement of the chapter, I only enter into this subject to show the injurious effects which sometimes follow in the train of despotic fashion. When these ill effects are so clearly visible, it is the duty of the medical profession to expose their ill results.

Rules for the General Management of the Hair.

The scalp should be well brushed twice a day with a fairly stiff brush. This brushing detaches any dead epithelium scales and dirt and at the same time stimulates the skin.

The hair should be tipped every other week, but care must be exercised that after tipping the scalp is not subjected to the barbarous rigor of having the hair brushed by machinery. This process tears out a great many healthy hairs and at the same time irritates the scalp and not infrequently damages the skin.

It is a good plan to have the scalp washed at intervals. Nothing is better than warm rain-water and a simple good soap, but care must be taken to thoroughly dry the scalp after this washing. In point of fact, it is this drying which constitutes the medicine of the process.

It is quite an undetermined point whether cutting and shortening the hair strengthens or prolongs its life. There are thousands of instances in which the hair has stood the test of time without ever being submitted to the hands of the barber, and in some regions of the body, such as the axillæ and eyelashes, the hair is never cut, and still it lasts so long as the organism, unless it becomes the victim of other diseases.

Still the truth is that if hair is left on the scalp and face, where it is exposed to so many external influences, it will become ragged and uneven at the ends, and it is for this reason that we advocate the cutting of hair every other week.

It is also necessary to admit that cutting the hair short does strengthen and thicken the shaft. The vital energy which is given off by each papilla is expended in producing thickness instead of length. It is for this reason that a practical and well-trained hairdresser will always promote the strength of hair by cutting off the tops of the growing and slender hairs in those who are getting bald.

Again, we must recognize now the necessities of social life. It would be a curious spectacle if men and women of the present day were to go about the world with shock heads of hair. What it is necessary to say very frankly and plainly is that hair cannot be curled by either paper, pins, or hot irons without damaging the hair both in length, brilliancy, and vitality. Any one who will take the trouble to examine the hair which

is now manipulated over the brow so as to produce a fringe, will see at once that such hair is, by comparison with the remainder of the scalp, of a much inferior quality, and we need not wonder that a simple structure of our bodies can be used so barbarously and still grow healthily. I can call to mind numberless cases in which I have been consulted by women and men as well for falling off of the hair, and on inspection I have found the scalp has been irritated and has become scaly and dry; the hair has looked burnt and unhealthy in those positions where it has been subjected at periodical intervals to the curling-irons. Another great feature in the management of the hair is to give it plenty of liberty and free exposure to light and air. The wearing of false hair is injurious because it excludes the two latter. And in many instances hopeless and permanent baldness has resulted from a coil which has been worn on a certain portion of the skull for any length of time. The immense advantage of exposure to air and light is well illustrated by the condition found in the heads of the two services. The sailor, who wears a cap and is often bareheaded, has, as a rule, a good head of hair, while the soldier who wears often a terribly heavy head-gear, becomes, as a rule, prematurely bald.

CHAPTER VII.

TREATMENT.

I HAVE avoided any reference to treatment while discussing the different forms of baldness, believing it would be better to take each variety separately, and endeavor by a rational therapeusis to place before my readers the plans which have been adopted for restoring the hair. The only way of accomplishing this is to discriminate the varieties of the condition, and taking the indications for treatment from the pathological state, endeavor in each instance to combat the cause. I am conscious that many of my formulæ are complicated and old-fashioned; but I am convinced that the more agreeable we make the preparations which have to be applied to the surface of the body, the more will our patients be pleased to apply them, and the greater will be our success.

The form of baldness which we find occurring in young ladies at the spring and autumn of the year will be found associated with a feeble condition of the organism, as will be indicated by the pallor of the gums and general feebleness, with cold hands and feet. These patients usually require some preparation of iron, and I have never had the same success with any other form as with the pills made according to the following formula:

℞ Ferr. sulphat. granulata,
Potassæ carbonatis, ... āā ʒ ij.
Tragacanth cum glycerini, ... q. s.
Fiat massa et divis. in pilul. no. xlviii.

I direct my patients to take three of these pills three times a day for the first week, then to diminish the dose to two three times a day for the second week, and afterward to keep taking one three times a day until the general health is improved. I advise them to have the hair tipped once a month, not to use a machine brush, and to spend a great deal of time in the

fresh air, without any head-gear; to partake of a generous meat diet, with a fair amount of fat, and where it is possible, to drink a pint of malt liquor daily, or some red wine. If this does not interfere with the digestion of food, I believe good arises from it. I advise them to rub well into the scalp the following washes, first the alkaline for a week, afterward the acid. The rubbing can only be accomplished by another person, who must be directed to use a piece of flannel or sponge:

Alkaline Hair Wash.

℞ Boracis, ... 3 i.
Glycerini, ... 3 ij.
Tinct. cantharidi, ... 3 vi.
Liq. ammon., B. P., ... ʒ i.
Ol. lauro-nobilis essent., ... ♏ iv.
Aquæ, ... ad ʒ vi.
Misce.

Acid Hair Wash.

℞ Acet. aromatici, ... 3 ij.
Glycerini, ... 3 ij.
Sp. vini rect., ... ʒ i.
Liq. epispastici, ... 3 i.
Aquæ flor. aurantii, ... ʒ ij.
Aquæ rosæ, ... ad ʒ vi.
Misce.

Precisely the same treatment is applicable to the premature baldness which occurs in men who are out of health. But where the baldness is associated with another malady, such as syphilis, then appropriate constitutional treatment must be introduced.

Where there is an accumulation of dead epithelium on the scalp, this must be removed by a shampooing liquid. The following formula is a useful preparation:

℞ Sapo animalis, B. P., ... ʒ ss.
Aq. coloniæ, ... 3 viij.
Liq. ammon., B. P., ... 3 vij.
Aquæ destill., ... ad ʒ x.

About a wineglassful of this is to be used twice a week; and the following morning the undermentioned pomatum is to be rubbed into the scalp:

℞ Medullæ purificati bovis, ... ℥ ss.
Ceræ alb., ... ʒ ss.
Balsam Peruv., ... ʒ ss.
Liq. epispastici, ... ʒ ss.
Ol. rosmarini, ... ♏ iv.
Ol. rosæ essen., ... ♏ ij.

Melt the marrow and wax together; then strain, and when nearly cold add the Peruvian balsam to the other ingredients. I believe the falling off of the hair in the aged has been retarded by this treatment, which will be found to make the scalp soft and healthy.

The cure of alopecia areata is always associated with very pleasing remembrances. Believing, as I do, in the communicability of the disease, I use in the first instance ointment made as follows:

℞ Acidi carbolici, ... ʒ i.
Hydrarg. bisulphureti, ... gr. x.
Lycopodii, ... gr. iv.
Glycerini, ... ʒ i.
Adipis recentis, ... ʒ viij.
Misce.

This I order to be well rubbed into the bald patches every night for two weeks, previously cleansing the scalp with egg and borax wash. I then direct my patient to use the stimulating pomade until the hair grows, and in no single instance have I failed. In ringworm of the scalp I always refuse to treat the case unless the child has had the head shaved, believing it to be impossible to bring any remedy into contact with the fungus unless this be done. I then direct the scalp to be well washed with a liquid made by dissolving one drachm of the Pharmacopœia soft soap and half a drachm of carbonate of potash in twelve ounces of rose-water. After this is done I direct my patient to wear a piece of lint covered with oil-skin continually for a week, which lint is saturated every two hours with the following lotion:

℞ Hydrarg. bichloridi, ... gr. vi.
Acidi carbolici, ... ʒ i.
Sp. vini rect., ... ʒ vi.
Glycerini, ... ʒ vi.
Aquæ. . . . . ad ℥ vi.
Misce.

After this has been earnestly carried out, I am sure the disease will in but few instances give further trouble. The rings will probably be scaly for some time afterward, but if the head is kept clean and the nitric oxide of mercury ointment of the Pharmacopœia used at intervals, the normal appearance will be resumed. I have tried stronger parasiticides on many occasions in the form of ointments, sometimes as strong applications, which I have painted on; but the success I have met with has been very much less than when treated by the lotion. The wonderful penetrating property of the glycerin, which mixes just as readily with fat as with water, carries down the carbolic acid and bichloride of mercury to the very bottom of the hair follicles, and destroys the fungus.

In treating tinea favosa, I have been obliged to poultice the scalp for some days, and to take considerable pains in the removal of the cups before I could apply exactly the same treatment as for ringworm. In treating sycosis of the beard, I have always directed my patients to shave; and where this has been done, without so much pain and difficulty as might be expected, I have told them to bathe the affected spots with a warm lotion made with borax and carbolic acid, two drachms of the former and one drachm of the latter to the pint; afterward, to rub in freely equal parts of the oleate of mercury and glycerin. I have tried epilation, and if it were thoroughly done, it appears the most efficacious treatment; but usually the patient will not submit to your extracting the hairs, and it is a tedious process; if left to himself it is but partially done, and the difficulty in bringing the remedy to the fungus is almost insurmountable; while by shaving, the mouths of the hair follicles are exposed, and by so doing the parasiticide is permitted to penetrate the sac.

Eczema, pityriasis of the scalp, seborrhœa, and lichen pilaris will often tax our ingenuity greatly. In fact, eczema of the scalp is one of the most obstinate conditions we ever

meet with. It is very often but an expression of a general dartrous state, and when this is the case, requires constitutional treatment; but it is to local remedies we must look for the best results. In the first instance, the head must be well washed with the shampooing liquid, freed from all crusts, scabs, and secretion. The hair should then be cut short, and an ointment carefully and freely applied to the entire scalp, made as follows:

℞ Hydrarg. ammon. chloridi, . . . ʒ ss.
Unguent hydrarg. nit. dil., . . . ʒ ss.
Lapis calaminari, ... ʒ ss.
Ol. palmæ purificati, ... ʒ ss.
Ol. amygdal. amar., ... ℥ ij.
Vaselini, ... ʒ viij.
Misce.

It so often occurs that pityriasis and psoriasis of the scalp are only expressions of a generally diseased state of the skin, that apart from the local treatment we shall have to resort to arsenic in some form. When the patient is gouty we must combine the mineral with an alkaline; but when the skin condition occurs in the young, has a tendency to relapse, and is associated with a general depression of the state of health, we may employ the syrupus ferri phosphatis cum arsenicum et quiniæ (Corbyn & Co.), in teaspoonful doses, three times a day, with singular benefit.

INDEX TO VOL. IX.

Abiaba, 137
Abrus precatorius, 17
Absinthin, 18
Acacia anthelmintica, 145
Acalypha indica, 18
Acanthospermum xanthioides, 160
Acetanilid, 19
Acetophenone, 122
Acetyl-amidophenol, 19
Acetylphenylhydrazine, 114, 167
Achrosin, 69
Acid, anemonic, 32
  anhydro - sulphamidobenzoic, 173
  anisic, 32
  carbonaphtholic, 65
  carbonic, 65
  chrysophanic, 76
  cresotic, 88
  cresotinic, 88
  cresylic, 88
  diiodoparaphenylsulphuric, 182
  dithiosalicylic, 92
  eugenic, 99
  gynocardic, 71
  hippuric, 112
  hydrochloric, presence in the stomach, 520
  hydrofluoric, 118
  lactic, 133
  orthohydrazin-paroxybenzoic, 148
  ortho-oxyphenylsulphurous, 47
  osmic, 149
  oxynaphthoic, 150
  phenylacetic, 158
  phenylhydrazin-levulinic, 42
  rheic, 76
  sozolic, 47
  sulphobenzidic, 47
  sulphoricinoleic, 190
  sulphurous, 191
  sulphydric, 192
Aconitine, 20
Aconitum ferox, 20
Aconitum heterophyllum, 20
Actinomeris helianthoides, 20
Adansonia digitata, 21
Adenium Boehmianum, 94
Adhatoda vasica, 21
Adonidin, 22
Adonis vernalis, 22
Agaricin, 23
Agaricus giganteus, 23
  muscarius, 24
Agave americana, 24
Alaninate of mercury, 24
Albinism, partial, 750
Albuminate of mercury, 25
Albumoses, 523
Alcohol, pseudo-amylic, 116
Alelia de Matto, 197
Aletrine, 25
Aletris farinosa, 25
Algarrobo blanco, 25
Alkaloids, borates of the, 54
Allamanda cathartica, 25
Aloe, American, 24
Alopecia, 752
  areata, 765, 794
  circumaptis, 765
  congenital, 752
  follicularis, 773
  parasitic, 758
  premature, 756, 792
  senile, 753, 794
  somatica, 771
  syphilitic, 772
  universalis, 774
Alstonia constricta, 26
  scholaris, 26
Alstonidine, 26
Alstonine, 26
Alum root, 105
Alvelos, 27
  milk, 27
Ambrosia artemisifolia, 28
Amido-propionate of mercury, 24
Ammonium, borate of, 55
  picrate of, 160
Amphopeptone, 522
Anacardium occidentale, 68

Anæsthetics, discussion on, 215
effects on cardiac function, 221
effects on respiration, 220
mortality from, 233
Anagyrine, 28
Anagyris fœtida, 28, 29
Analgesine, 34
Analyzer for spectacles, 299
Anchietea salutaris, 29
Anchietine, 29
Anda açu, 30
Anda Assu, 30
Anda Gomesii, 30
Andira inermis, 30
Andrographis paniculata, 31
Anemone camphor, 31
Pulsatilla, 31
Anemonic acid, 32
Anemonin, 31
Angelim, 30
Anhydro-sulphamidobenzoic acid, 173
Anilin, camphorate of, 62
Anisate of sodium, 32
Anisic acid, 32
Annidaline, 33
Anogeissus latifolius, 33
Anona muricata, 33
triloba, 47
Antiarin, 34
Antiaris toxicaria, 34
Antidiabetic bark, 68
Antifebrin, 19
Antipeptone, 522
Antipyrine, 34
Antirrhinum majus, 36
Antisepsis and antiseptics, 36
medical 38
surgical, 40
Antithermin, 42
Apocynein, 43
Apocynin, 43
Apocynum cannabinum, 43
Apone, 43
Araroba, 44
Ararobin, 76
Arbutin, 44
Arctium Lappa, 44
Area Celsi, 765
Areca, 45
Arecaine, 45
Arecaline, 45
Aristol, 45
Armel, 153
Arsenic, bromide of, 56
Artar root, 211
Artichoke, 90
Arusa, 21
Asclepias tuberosa, 45
Asepsis and aseptics, 46
Aseptol, 47
Ash, prickly, 211
Asimina triloba, 47
Asiminine, 47
Aspidosperma Quebracho, 168
Aspidospermine, 168
Association and morals, 648
Asteracantha longifolia, 48
Astragalus mollissimus, 48
Atherosperma moschata, 48
Atis, 20
Atropa Mandragora, 139
Azadirachta indica, 48
Azok, 177

Bacteria, differentiation of, 5
passage through the stomach, 517
Bacterioktene, 166
Bacteriology, advances in, 3
benefits derived from, 10
Bael, 50
Baldness and grayness, 727
treatment, 792
Ballota suaveolens, 49
Bambusa arundinacea, 49
Baobab, 21
Baptin, 49
Baptisia tinctoria, 49
Baptisin, 49
Baptitoxine, 49
Barbadoes nut-tree, 127
Barbasco, 50
Batiator, 209
Bauchée, 166
Baycurru, 109
Bean, large garden, 210
Windsor, 210
Bebeeru, 148
Bela, 50
Belladonna, Japanese, 178
Belladonnine, 50
Benzanilid, 51
Berberine, 51
Berberis asiatica, 51
Lycium, 52
Betol, 52
Bevilacqua, 118
Bibirine, 148
Bibiru, 148
Bikh, 20
Biniodide of dithymol, 45
of mercury, 52
Bish, 20
Bismuth, borate of, 55
salicylate of, 174
subiodide of, 186
Bisulphydrate of phenyl, 198
Bituminate of iodoform, 53
Blood-root, 177

Bocquillon-Limousin, H., on new remedies and new medicinal preparations, 15
Boerhavia diffusa, 53
Boldine, 54
Boldo, 53
Boldoa fragrans, 53
Bonduc, 54
Bonducin, 54
Borate of ammonium, 55
of bismuth, 55
of chinoidine, 55
of quinine, 56
Borates of the alkaloids, 54
Boussingaultia baselloides, 56
Bowditchia major, 187
Bresillette, 83
false, 83
Bromide of arsenic, 56
of gold, 57
of nickel, 57
Bromoform, 57
Buchinka, 58
Buckthorn, purging, 169
Bunias maritima, 61
Burdock, 44
Burra gokeroo, 200
Busenna, 145
Butea frondosa, 58
Butter-nut, 128
Butyl-chloral, 58

Cabbage-tree, 30
Cactus grandiflorus, 60
Cæsalpinia Bonducella, 54
Caffeine, 60
Cailcedra, 131
Cailcedrine, 131
Caju, 68
Cajuero, 68
Cakyle, 61
Calabash tree, 88
Calaguala, 165
Calibeau, 95
Calophyllum Inophyllum, 62
Calotropis gigantea, 62
Calycandra Houstoni, 151
Camphor, carbolate of, 64
phenolated, 64
Camphorate of anilin, 62
Camphorated phenols, 63
Canadian hemp, 43
Canadol, 156
Cancer of the stomach, diagnosis of, 535
Candahol, 156
Canities, 778
etiology, 778
Cannabis indica, 63
Canutillo, 64
Capsicum, concentrated tincture of, 43
Caranna, 64
Carapa guianensis, 64
touloucouna, 64
Carbamate of ethyl, 202
Carbamic ether, 202
Carbolate of camphor, 64
of mercury, 157
Carbon, tetrachloride of, 196
Carbonaphtholic acid, 65
Carbonic acid, 65
Cardol, 68
Carica Papaya, 66
Carnauba, 66
Caroba, 127
Carobine, 127
Carobone, 127
Casca, 97
Cascara amarga, 66
sagrada, 67
Casein, saccharide of, 174
Cashew, 68
Cassia Absus, 69
alata, 68
auriculata, 69
occidentalis, 69
Catarrhal inflammation of the stomach, diagnosis of, 540
Catha edulis, 70
Caulophyllin, 70
Caulophyllum thalictroides, 70
Cayapona globulosa, 70
Cayaponine, 70
Cedrine, 180
Cerium, oxalate of, 150
valerianate of, 203
Charmweed, 138
Chaulmoogra or chaulmugra, 71
Chewstick, Jamaica, 106
Chicken tuberculosis, bacillus of, 7
Chimaphila corymbosa, 72
umbellata, 72
Chimaphilin, 72
Chinoidine, borate of, 55
Chinoiodine, 72
Chinoline, 72
Chin-whelk, 768
Chionanthus virginica, 73
Chironia angularis, 172
Chloral formamide, 73
hydrocyanate, 74
Chloralamide, 73
Chloral-antipyrine, 122
Chloralimide, 75
Chloralurethane, 202
Chloride of methyl, 75
Chloroform, administration of, 257
and ether compared, 231
mortality from, 217, 224
question of overdose, 262

Chloroform syncope, primary, 243
use of, 235
Chloromethane, 75
Choisy, 129
Chrysarobin, 76
Chrysophanic acid, 76
Cimicifuga racemosa, 77
Cimicifugin, 77
Cinchona, Senegal, 131
Cinchonamine, 77
Cineraria maritima, 78
Cipo summa, 29
Citrate of cocaine, 81
Clibadium biocarpum, 50
Cloudberry, 172
Cover's inhaler, use of, 234, 238
Coats, Joseph, on anæsthetics, 217
Cocaine, 78
citrate of, 81
hydrochlorate of, 80
saccharinate of, 81
salicylate of, 81
Cocillana, 81
Coco purgatif, 30
Cocoa tree of the Seychelles, 137
Codaga-pala, 113
Coix Lacryma, 81
Colchicine, 81
Collinsonia canadensis, 82
Collodion, flexible, 153
Colorin, 97
Colubrina reclinata, 82
Comocladia integrifolia, 83
Comparison in the diagnosis of insanity, 650
Condurango, 83
Conessie, 113
Conessine, 113
Congo root, 155
Conscience as a moral guide, 643
Contrayerva, 83
Convallamarin, 84
Convallaria majalis, 84
Convallarin, 84
Convergence, absolute range of, 308
effect on, of displaced or decentred lenses, 304
maximum of, 307
minimum of, 306
relative range of, 308
Copper, phosphate of, 158
Coptis anemonæfolia, 84
Cordyla Houstonia, 151
Cornel, 84
Cornus florida, 84
Corydaline, 85
Corydalis formosa, 85
Corypha cerifera, 66
Cosmetics, 785
Coto, 85
verum, 85
Cotoin, 85
Cotton plant, 106
Crab nuts, 64
Crazy weed, 48
Creole quinine, 159
Creolin, 85
Cresalol, 87
Crescentia Cujete, 88
Cresol, 88
salicylate of, 87
Cresotic acid, 88
Cresotinate of sodium, 88
Cresotinic acid, 88
Cresyl, hydrate of, 88
Cresylic acid, 88
phenol, 88
Cresylol, 88
Crime and monomania, relations between, 606
causes of, 639
committed during convalescence from insanity, 714
Criminal disposition and insanity, relation between, 709
Criminality and insanity, distinction between, 603
ethico-legal relations determining, 563
Croton chloral, 58
Cryptocariine, 89
Cryptocarya australis, 89
Cryptochæte andicola, 113
Cucumber, wild, 95
Curare, 89
Curarine, 89
Custard apple, 33
Cyanide of mercury, 89
of zinc, 89
Cybistax antisyphilitica, 127
Cynara Scolymus, 90
Cypripedin, 90
Cypripedium pubescens, 90

Dadi-Gogo, 105
Damiana, 90
Danaidin, 91
Danais fragrans, 91
Dandruff, 773, 793
Darutyne, 179
Death camoss, 212
Deer's tongue, 136
Delusion, definition of, 606
Devildora, 91
Dhaura gum, 33
Diabetes, gastric disturbances in, 552
wood, 20
Diagnosis of diseases of the stomach, the modern, 515

Diethylsulphondimethylmethane, 188
Digestion in man, 529
recent observations in animals, 524
secondary disturbances of, diagnosis of, 548
Digitalis ambigua, 91
Diiodoparaphenylsulphuric acid, 182
Dilatation of the stomach, diagnosis of, 543
Dimethylate of methylene, 143
Dimethylbenzene, 211
Dimethyl-ethyl-carbinol, 116
Dimethyloxyquinizine, 34
Dimethylphenylpyrazolone, 34
Diphenylmethane, 158
Diplopia tests, 313
Dita, 26
Ditamine, 26
Ditana digitifolia, 92
Dithiosalicylate of sodium, 92
Dithiosalicylic acid, 92
Dithymol, biniodide of, 45
Diuretin, 93
Divine herb, 179
Divorce and insanity, 601
Dog's bane, 43
Dogwood, 84
Jamaica, 162
Doliariin, 104
Dorstenia brasiliensis, 83
Doundaké, 93
Doundakine, 93
Duboisia Hopwoodii, 94
myoporoides, 94
Duboisine, 94
Duvaua dependens, 94
Dyspepsia, diagnosis of, 541, 546

Echicerin, 27
Echitamine, 27
Echitenin, 27
Echites scholaris, 26
Echujin, 94
Eczema of the scalp, treatment, 795
Education and morals, 646
Elaterin, 95
Elaterium momordica, 95
Electricity in the treatment of uterine tumors, 327
Embellia Ribes, 95
Entada scandens, 95
Ephedra syphilitica, 64
Ephedrine, 95
Ergotinine, 96
Erigeron canadense, 96
Eriodictyon californicum, 212
Erotomania, 663
Erythrina Corallodendron, 97
Erythrocentaurin, 172
Erythrocoralloidine, 97
Erythrophlœine, 97
Erythrophlœum guineense, 97
Eschscholtzia californica, 98
Esophoria, 320
Ether as an anæsthetic, 238
carbamic, 202
contra-indications, 240
formyl-amidophenic, 104
methyliodohydric, 125
petroleum, 156
Ether-drinking, details of the trade, 498
dose, 503
effects, 508
geographical distribution, 497
history, 494
its prevalence and results, 493
methods of drinking, 503
prevalence of, 504
remedies, 511
Ethoxycaffeine, 98
Ethyl, carbamate of, 202
Ethyl-chloral-urethane, 181
Ethylurethane, 202
Eucalyptol, 98
Eucalyptus honey, 99
Eugenia Cheken, 99
Eugenic acid, 99
Eugenol, 99
Eulyptol, 100
Euonymin, 100
Euonymus atropurpureus, 100
Eupatorium amarissimum, 100
saturejæfolium, 108
Euphorbia Drummondi, 100
geniculata, 101
heterodoxa, 27
pilulifera, 101
piscidia, 101
Exalgin, 101
Excœcaria Agallocha, 103
cataphracta, 103
Exophoria, 320
Eyes, localization of the, 296

Fabiana imbricata, 103
Favus, 759, 795
symptoms and course, 761
Feather disease, 784
Fedegosa, 69
Ficus doliaria, 103
Flacourtia cataphracta, 104
Fleabane, Canada, 96
Flemingin, 210
Formulary of new remedies and new medicinal preparations, 15
Formyl-amidophenic ether, 104
Franciscea uniflora, 104

Fringe tree, 73
Functional disease, nature of, 703

Gastric juice, action of, 521
Gastritis, diagnosis of, 540
Geissospermine, 152
Geissospermum læve, 152
Gelatin tablets, medicated, 140
Gelsemine, 105
Gelsemium sempervirens, 105
Gendarussa vulgaris, 129
Geoffroya inermis, 30
Geranine, 105
Geranium maculatum, 105
Goa powder, 44
Gogo, 105
Gold, bromide of, 57
Golden seal, 115
Gonolobus Condurango, 83
Gossypium herbaceum, 106
Gouania domingensis, 106
Gravel root, 100
Gray oil, 106
Grayness of the hair, 778
Grindelia robusta, 107
Guachamaca toxifera, 107
Guachamacine, 108
Guacin, 108
Guaco, 108
Guaiacol, 108
Guarea trichiloides, 108
Guaycurru, 109
Guazuma ulmifolia, 109
Guilandina Bonducella, 54
Guiné, 156
Guinea-hen weed, 155
Gurjun balsam, 109
Gymnema silvestre, 110
Gynocardia odorata, 71
Gynocardic acid, 71

Habzelia ethiopica, 110
Hair, anatomy of the, 728
  and temperament, 736
  anomalies of coloration, 747
  as a race character, 744
  as a tactile organ, 735
  change of color of the, 747
  chemistry of the, 736
  color and texture of the, 743, 749
  cosmetics, 787
  erection of the, 738
  expansion and splitting of the, 783
  grayness of the, 778
  growth after death, 736
  growth and development of the, 734
  nerves of the, 742
  nutrition of the, 740
Hair, permeability of the, 740
  phagmesis of the, 784
  physiology of the, 734
  rate of growth, 739
  root sheath of the, 738
  rules for the general management of the, 790
  shedding of the, 739
  speckled or spotted, 748
  sudden blanching of the, 748
  transpiration of the, 741
  transplantation of the, 735
  washes, 793
Hairdressers and barbers of the ancients, 786
Hairs, number of, 731
  ringed, 785
Hamamelis virginiana, 110
Harmaline, 153
Harmel, 153
Harmine, 153
Hart, Ernest, on ether-drinking; its prevalence and results, 491
Hartley, Dr., on ether as an anæsthetic, 238
Haya poison, 111
Heart disease, gastric disturbances in, 531
Heliotropin, 162
Heliotropum indicum, 111
Hemp, Canadian, 43
Henderson, T. Brown, on anæsthetics, 233
Henna, 135
Heracleum lanatum, 112
Herb, divine, 179
Herpes tonsurans, 763
Heterophoria, 320
  tests for, 322
Hinteah, 110
Hippurate of lime, 112
  of lithium, 112
  of sodium, 112
Hippuric acid, 112
Hoang-nan, 112
Hog's potato, 212
Holarrhena africana, 113
  antidysenterica, 113
Holy bark, 67
Honduras bark, 66
Horripilation, 738
Hound's tongue, 136
Huamanripa, 113
Huingan, 94
Hura crepitans, 114
Hydrate of cresyl, 88
Hydracetin, 114
Hydrangea arborescens, 115
Hydrangin, 115
Hydrastine, 115
Hydrastinine, 11

Hydrastis canadensis, 116
Hydrate of amylene, 116
Hydrochlorate of cocaine, 80
of orexin, 117
of phenyldihydrochinazoline, 117
Hydrochloric acid, presence in the stomach, 520
Hydrocotyle asiatica, 118
Hydrofluoric acid, 118
Hydrogen, sulphuretted, 192
Hydronaphthylamine, 119
Hydroxylamine, 119
Hygrine, 119
Hygrophila spinosa, 48
Hymenæa Courbaril, 120
Hymenodictyon excelsum, 120
Hymenodictyonine, 120
Hyoscyamine, 121
Hyoscine, 120
Hyperesophoria, 320
Hyperexophoria, 320
Hyperphoria, 320
Hypnal, 122
Hypnone, 122
Hypochondriasis and insanity, 631
Hysterionica Baylahuen, 123

Ichthyol, 124
Icica icicariba, 64
Imitation as a factor in insanity, 681, 683, 690
Impulsive insanity, 668
insanity, diagnosis, 669, 698
insanity, illustrative cases, 677, 685
insanity, varieties, 675
Indigo, wild, 49
Inhaler, Clover's, use of, 234, 238
Insane criminal acts, mental states originating, 587
criminal acts, varieties of, 587
Insanity a growing plea, 719
and criminality, distinction between, 603
and divorce, 601
and hypochondriasis, 631
and religion, 628
feigned, 720
impulsive, 668
impulsive, diagnosis, 669, 698
impulsive, illustrative cases, 677, 685
impulsive, varieties, 675
moral, 638
necessity for restraint, 705
possibility of diagnosis, 573
question of medical jury, 584
responsibility in, difference between legal and medical doctrines, 560
Intestines, their place in the digestive function, 516
Iodide of methyl, 125
Iodized phenols, 33
Iodoform, bituminate of, 53
Iodol, 125
Ipecac, 53
Ipecacuanha of Goa, 147
Ipeuva, 126
Iridin, 126
Iris versicolor, 126
Isatropylcocaine, 126

Jacaranda Caroba, 127
lancifoliata, 127
procera, 127
tomentosa, 127
Jahari, 137
Jambol, 193
Jambosine, 193
Jambul, 193
Jankonin, 130
Jasmine, red, 164
yellow, 105
Jatropha Curcas, 127
Java tea, 149
Jequirity, 17
Job's tears, 81
Johannesia princeps, 30
Johannesine, 30
Juglandin, 128
Juglans cinerea, 128
Jurubeba, 128
Justicia Adhatoda, 128
Gendarussa, 129
paniculata, 31

Kairine, 129
Kaladana, 129
Kamala, 129
Kandol, 156
Kariyat, 31
Katine, 70
Kava, 130
Kavain, 130
Kaya senegalensis, 131
Keith, Thomas, and Keith, Skene, on electricity in the treatment of uterine tumors, 325
Kidney diseases, gastric disturbances in, 552
Kirk, Robert, on primary chloroform syncope, 243
Kleptomania, 661, 695
Koch, R., on advances in bacteriology, 1
Kola, 131
Koumys, 131
Kowri resin, 132

Lachnanthes tinctoria, 132

Lactate of quinine, 133
Lactic acid, 133
Lactose, 144
Ladies' slipper, 90
Lamium album, 134
Lanolin, 134
Lantana brasiliensis, 135
Lantanine, 135
Lappine, 44
Lawsonia alba, 135
  inermis, 135
Leadwort, 164
Legumin, 135
Lenses, decentring of, 288
  displaced or decentred, the effect on convergence of, 304
  with prisms, combinations of, 288
Leonotis nepetæfolia, 136
Leptandra virginica, 136
Leptandrin, 136
Liatris odoratissima, 136
Light, influence on bacteria, 9
Ligusticum apiifolium, 136
Lilac, Indian, 48
Lily of the valley, 84
Lime, hippurate of, 112
Lipanin, 137
Lippia mexicana, 137
Lippiol, 137
Lithium, hippurate of, 112
  salicylate of, 175
Localization of the eyes, 296
Loco weed, 48
Locust tree, 120
Lodoicea Sechellarum, 137
Lopez root, 199
Lovage, 136
Lucuma Cainito, 137
  glycyphlœum, 138
  mammosum, 138
Lucumine, 137
Lycopodium clavatum, 138
  Saururus, 138
Lycopus virginicus, 138

Macewen, William, on anæsthetics, 215
Maddox, Ernest E., on the clinical use of prisms and the decentring of lenses, 265
Malingering, detection of, 314
Mallotonin, 130
Malonetia nitida, 107
Mammea americana, 139
Manacine, 104
Mancone, 97
Mangifera indica, 139
Mango tree, 139
Mandragora, 139
Mandragorine, 139
Marmalade tree, 138
Masterwort, 112
Mastic, Peruvian, 178
Mata gallina, 101
Meconarceine, 139
Meconate of narceine, 139
Medicated gelatin tablets, 140
  soaps, 141
Melia Azadirachta, 48
Melon tree, 66
Mentagra, 768
Menthol, 142
Mercury, alaninate of, 24
  albuminate of, 25
  amido-propionate of, 24
  biniodide of, 52
  carbolate of, 157
  cyanide of, 89
  phenolate of, 157
  succinimide of, 187
  thymolate of, 199
  vegetable, 62, 104
Methacetin, 143
Methyl, chloride of, 75
  iodide of, 125
  perchlorated chloride of, 196
Methylacetanilid, 101
Methylal, 143
Methylchlorhydric ether, 75
Methylene, dimethylate of, 143
Methylhydride of oxyquinoline, 129
Methyliodohydric ether, 125
Micro-organisms and infectious diseases, connection between, 7
Mikania Guaco, 108
Milk-sugar, 144
Mind, unsoundness of, in its legal and medical considerations, 559
Mollin, 145
Momordica operculata, 58
Monesia Guaranhem, 138
Monomania and crime, relations between, 606
  medico-legal aspects of, 588
Monomaniacs, religious, 629
Moral insanity, 638
Morals and association, 648
  and education, 646
Morphine, phthalate of, 159
Moussena, 145
Moussenin, 145
Mudar, 62
Mulls, Unna's plaster, 163
Muscarine, 24
Mycosis achorina, 759
Myrtol, 145

Napelline, 20
Naphthalin, 146
Naphthol, 146

Naphthol, salicylate of, 175
Narceine, meconate of, 139
Naregamia alata, 147
Naregamine, 147
Ndilo, 62
Nectandra Puchuri, 147
Rodiæi, 148
Nectandrine, 148
Negro coffee, 69
Nering's fruit, 200
Nerium Oleander, 148
Nettle, white, 134
Nickel, bromide of, 57
Nitroglycerin, 201
Nitrous oxide as an anæsthetic, 233

Œsophageal tube, use in diagnosis, 528
Oil, gray, 106
Oleandrine, 148
Orexin, hydrochlorate of, 117
Orthin, 148
Orthohydrazin-paroxybenzoic acid, 148
Ortho-oxyphenylsulphurous acid, 47
Orthophoria, 320
Orthoscopic spectacles, 295
Orthosyphon stamineus, 149
Osmic acid, 149
Ouabain, 149
Ouabaio, 149
Oxalate of cerium, 150
Oxyacanthine, 51
Oxyammonia, 119
Oxyhydromethylquinoline, 129
Oxymethylquinizine, methylated, 34
Oxynaphthoic acid, 150
Oxyquinoline, methylhydride of, 129

Pambotano, 151
Pangium edule, 151
Pao Pereira, 152
Papaine, 66
Papaw, 66
Para-acetanisidin, 143
Para-acetphenetidin, 156
Paracotoin, 85
Paracresalol, 87
Paracresotinate of sodium, 152
Paracresyl-salicylic ether, 87
Parameria vulneraria, 152
Paraoxytolnate of sodium, 152
Pareirine, 152
Parthenine, 153
Parthenium Hysterophorus, 153
Pasque-flower, 31
Pedalium Murex, 153
Peganum harmala, 153
Pellicle, 153
Pennywort, Indian, 118
Pepper, Australian, 165
Peptone, formation of, 521
Periodicity in mental disease, 712
Petiveria alliacea, 155
tetrandra, 156
Petroleum ether, 156
Peumus Boldus, 53
Phagmesis of the hair, 784
Pharbitis Nil, 129
Pharbitisin, 129
Phenacetin, 156
Phenol as an anæsthetic, 157
cresylic, 88
salicylate of, 176
Phenolate of mercury, 157
Phenolated camphor, 64
Phenols, camphorated, 63
iodized, 33
Phenyl, bisulphydrate of, 198
Phenylacetamide, 19
Phenylacetic acid, 158
Phenyldihydrochinazoline, hydrochlorate of, 117
Phenylhydrazin-levulinic acid, 42
Phenylmethane, 158
Phenylmethyl-acetone, 122
Phosphate of copper, 158
Phrynium Beaumetzii, 105
Phthalate of morphine, 159
Phthisis, gastric disturbances in, 548
Phyllanthus Niruri, 159
Physic nut, 127
Phytolacca decandra, 160
Picao da praia, 160
Pichi, 103
Picramnia antidesma, 66
Picramnine, 66
Picrate of ammonium, 160
Piligaline, 138
Pilocarpine, 161
Pilosis, 778
Pilpara, 95
Pinkroot, 183
Piper methysticum, 130
Novæ Hollandiæ, 165
Piperonal, 162
Pipi, 156
Pipsissewa, 72
Piscidia Erythrina, 162
Pitché, 103
Pitcher-plant, 177
Pituri, 94
Piturine, 94
Pityriasis of the scalp, treatment, 795
Plantago hispidula, 163
recumbens, 163
Plaster mulls, 163

Pleurogyne rotata, 163
Plica polonica, 783
Plumbago zeylanica, 164
Plumiera alba, 164
Poke root, 160
Polygonum Hydropiper, 165
Polypodium adiantiforme, 165
Polyporus senex, 23
Polysolve, 190
Pongamia glabra, 165
Porphyrine, 26
Porphyrosine, 26
Porrigo decalvans, 765
  scutulata, 763
Prickly ash, 211
Prismetry, 278
Prisms, abducting and addncting, 275
  adjustment in the trial-frame, 285
  chief clinical applications of, 306
  chromatic aberration, 270
  clinical properties of, 271
  clinical use of, 265
  dispersion, 270
  geometrical properties of, 268
  in the consulting-room, 306
  marking the apex, 276
  minimum deviation, 270
  optical properties of, 269
  planeness of surface, 284
  temporary trials, 286
  with lenses, combinations of, 288
  worn for relief of strain, 315
Proctene, 166
Prosopis alba, 25
Pseudaconitine, 20
Pseudo-amylic alcohol, 116
Psoralea corylifolia, 166
Ptychotis Ajowan, 166
Purser, J. M., on the modern diagnosis of diseases of the stomach, 513
Pyoktanines, 166
Pyoktanins, 166
Pyrodin, 167
Pyrola umbellata, 72
Pyromania, 662

Quebracho, 168
Queen's root, 183
Quince, Bengal, 50
Quinine, borate of, 56
  Creole, 159
  lactate of, 133
  sulphovinate of, basic, 190
  sulphovinate of, neutral, 191

Rascamone, 136
Rauwolfia canescens, 168
Red root, 132
Religion and insanity, 628
Religious monomaniacs, 629
Resin, kowri, 132
  oil, 171
Resinol, 171
Resorcin, 168
Responsibility and mental condition, relation between, 706
Retinol, 171
Rhamnus Alaternus, 169
  catharticus, 169
  coriaceus, 170
  Purshianus, 67, 170
Rheic acid, 76
Rhein, 76
Rhinacanthine, 170
Rhinacanthus communis, 170
Rhinanthin, 36
Rhus aromatica, 170
Ricin, 171
Ringworm, common, 763, 794
Robinson, Tom, on baldness and grayness, 725
Rose-bay tree, 148
Rose-campion, 31
Rosinol, 171
Rottlera tinctoria, 129
Rottlerin, 130
Rubus chamæmorus, 172
Rumex crispus, 172
Rusot, 52

Sabattia angularis, 172
Saccharide of casein, 174
Saccharin, 173
Saccharinate of cocaine, 81
Salicylate of bismuth, 174
  of cocaine, 81
  of cresol, 87
  of lithium, 175
  of naphthol, 175
  of phenol, 176
  of theobromine and sodium 93
Salinaphthol, 175
Salix nigra, 176
Salol, 176
Sand-box tree, 114
Sanguinaria canadensis, 177
Sanguinarine, 177
Saraca indica, 177
Sarcocephalus esculentus, 93
Sarcostemma viminale, 177
Sarracenia purpurea, 177
Sassafras, Australian, 48
Sassy, 97
Schinus molle, 178
Scopolia japonica, 178
  lucida, 178
Scopoline, 178

Scutellaria lateriflora, 178
Scutellarin, 179
Seborrhœa capillitii, 773, 793, 795
Senecio canicida, 179
maritima, 78
Senegal cinchona, 131
Sethia acuminata, 179
Sida floribunda, 179
Side-saddle flower, 177
Siegesbeckia orientalis, 179
Simaba Cedron, 180
Simulo, 180
Skin, anatomy of the, 727
glands of the, 727
muscles of the, 728
Smartweed, 165
Smilax Japicanga, 180
Snap-dragon, 36
Snowberry, 193
Soaps, medicated, 141
Sodium, anisate of, 32
cresotinate of, 88
dithiosalicylate of, 92
hippurate of, 112
paracresotinate of, 152
paraoxytoluate of, 152
Soja hispida, 180
Solanine, 181
Solanum paniculatum, 128
Solvin, 190
Somnal, 181
Somniferine, 210
Sophoria tinctoria, 49
Sour sap, 33
Soymida febrifuga, 182
Sozoiodol, 182
Sozolic acid, 47
Sparteine, 182
sulphate of, 188
Spectacles, analysis of, 299
orthoscopic, 295
Spigelia marilandica, 183
Spigeline, 183
Spiny furze, 202
Spiræa Filipendula, 183
Spiritualism, belief in, 596
Statice brasiliensis, 109
Sterculia acuminata, 131
Stillingia sylvatica, 183
Stomach, cancer of the, diagnosis of, 535
catarrhal inflammation of the, diagnosis of, 540
digestive power of, 520
dilatation of the, diagnosis of, 543
germicidal function of, 517
its place in the digestive function, 515
presence of hydrochloric acid in the, 520
Stomach, secretion of different parts of the, 520
testing the contents of the, 532
the modern diagnosis of diseases of the, 515
ulcer of the, diagnosis of, 538
Strophanthin, 184
Strophanthus, 183
Strychnos Gautheriana, 112
Subiodide of bismuth, 186
Succinimide of mercury, 187
Sucupira, 187
Sugar of milk, 144
Sulphaminol, 187
Sulphate of sparteine, 188
Sulphide of zinc, hydrated, 117
Sulphobenzidic acid, 47
Sulpho-carbol, 47
Sulpholein, 190
Sulphonal, 188
Sulphoricinoleic acid, 190
Sulphovinate of quinine, basic, 190
of quinine, neutral, 191
Sulphuretted hydrogen, 192
Sulphurous acid, 191
Sulphydric acid, 192
Sumac, aromatic, 170
Sursumduction, 321
Swietenia febrifuga, 182
senegalensis, 131
Sycamore, false, 48
Sycosis, 768, 795
Sympathy as a factor in insani 681, 683, 690
Symphoricarpus vulgaris, 193
Syncope, primary chloroform, 243
Syzygium jambolanum, 193

Tabaschir, 49
Tabernæmontana neriifolia, 193
Tablets, medicated gelatin, 140
Tanghinine, 194
Tayuya, 194
Tayuyin, 194
Tecoma speciosa, 126
Teli, 97
Terebene, 195
Terpin, 195
Terpinol, 195
Testing the contents of the stomach, 532
Tetrachloride of carbon, 196
Tetrahydro-beta-naphthylamine, 119
Tetrahydroparaquinanisol, 196
Tetra-iodo-pyrrol, 125
Thalline, 196
Theine, 60
Theobromine and sodium, salicylate of, 93
Thevetia neriifolia, 197

Thevetin, 198
Thiol, 198
Thioresorcin, 198
Thymolate of mercury, 199
Tinea decalvans, 765
favosa, 759, 795
tonsurans, 763, 794
tonsurans, symptoms and course, 764
vera, 759
Toddalia aculeata, 199
Torenia diffusa, 203
Toxalbumins, 9
Tradescantia erecta, 199
Tragia volubilis, 200
Traumaticin, 199
Trianosperma ficifolia, 194
Trianospermine, 194
Tribulus lanuginosus, 200
Trichloracetyl-dimethylphenylpyrazolone, 122
Trichlorophenol, 200
Trichophytosis furfuracea, 763
Trichorrhexis nodosa, 784
Trinitrin, 201
Tubercle bacillus, characteristics of, 6
Tuberculosis, curability of, 11
Tulipine, 201
Tumors, uterine, electricity in the treatment of, 327
Turnera aphrodisiaca, 90
opifera, 90
ulmifolia, 90
Turnsole, Indian, 111
Tylophora asthmatica, 201

Ulcer of the stomach, diagnosis of, 538
Ulex diureticus, 202
Ulexine, 202
Unona ethiopica, 110
Unsoundness of mind, in its legal and medical considerations, 559
Upas antiar, 34
Ural, 202
Uralium, 202
Urethane, 202
Uterine tumors, electricity in the treatment of, 327

Valerianate of cerium, 203
Vandellia diffusa, 203
Vaselin, liquid, medicinal, 204
Vellarin, 118
Venus' slipper, 90
Vernonia nigritiana, 209
Vernonin, 209
Veronica virginica, 136
Viburnin, 209
Viburnum prunifolium, 209
Vicia, 210
faba, 210

Wahoo, 100
Walnut-tree, Indian, 21
Warras, 210
Wars, 210
Williams, J. W. Hume, on unsoundness of mind, in its legal and medical considerations, 557
Wintergreen, 72
Witch hazel, 110
Witchcraft, belief in, 599
Withania coagulans, 210
somnifera, 210
Wormgrass, 183
Wrightine, 113

Xanthoxyline, 211
Xanthoxylum caribæum, 211
fraxineum, 211
Naranjillo, 211
senegalense, 211
Xylene, 211
Xylol, 211

Yerba de Cotona, 111
de la pueblo, 179
de quinino, 159
del pollo, 199
sagrada, 135
santa, 212

Zigadenus venenosus, 212
Zinc, cyanide of, 89
hydrated sulphide of, 117

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CONTENTS OF VOL. IX.

ADVANCES IN BACTERIOLOGY.

By R. Koch, M.D.

PAGE

An Address delivered before the Tenth International Medical Congress, August 4th, 1890, ... 1

FORMULARY OF NEW REMEDIES AND NEW MEDICINAL PREPARATIONS.

By H. Bocquillon-Limousin.

An Alphabetical List, ... 15

DISCUSSION ON ANÆSTHETICS.

By Dr. William Macewen, Dr. Joseph Coats, Dr. T. Brown Henderson, Dr. Hartley, and Dr. Robert Kirk.

CHAPTER I.

Introduction, ... 215

CHAPTER II.

The Action of Anæsthetics on the Respiration and Cardiac Action and on the Risks Incident to this Action, ... 217

CHAPTER III.

On the Relative Value of the Various Anæsthetics, ... 233

CHAPTER IV.

Ether as an Anæsthetic, ... 238

PAGE

CHAPTER V.

On Primary Chloroform Syncope, ... 243

CHAPTER VI.

Appendix, ... 262

THE CLINICAL USE OF PRISMS AND THE DECENTRING OF LENSES.

By Ernest E. Maddox, M.B.

CHAPTER I.

A. Simplest Properties of Prisms, ... 268
B. Marking the Apex, ... 276
C. Prismetry, ... 278
D. Planeness of Surface, ... 284
E. Adjustment of Prisms in the Trial-frame, ... 285
F. Temporary Trials, ... 286

CHAPTER II.

Decentring of Lenses; and Combinations of Prisms with Lenses, 288

CHAPTER III.

Localization, ... 296

CHAPTER IV.

Analysis of Spectacles, ... 299

CHAPTER V.

A Brief Outline of the Chief Clinical Applications of Prisms, . 306
Appendix, ... 320

ELECTRICITY IN THE TREATMENT OF UTERINE TUMORS.

By Thomas Keith, M.D., LL.D. Edin., and Skene Keith, F.R.C.S. Edin.

A Record of One Hundred and Six Cases, ... 325

ETHER DRINKING; ITS PREVALENCE AND RESULTS.

By Ernest Hart.

PAGE

History—Geographical Distribution—Details of the Trade—Methods of Drinking, Dose, etc.—Effects, Immediate and Remote—Remedies, ... 493

THE MODERN DIAGNOSIS OF DISEASES OF THE STOMACH.

By J. M. Purser, M.D., Dublin.

The Place of the Stomach in the Function of Digestion, . . 515
The Use of the Œsophageal Tube, ... 528
In Cancer, ... 535
In Chronic Ulcer, ... 538
In Catarrhal Inflammation, ... 540
In Dilatation, ... 543
In Nervous Dyspepsia, ... 546
In Secondary Disturbances of Digestion, ... 548

UNSOUNDNESS OF MIND, IN ITS LEGAL AND MEDICAL CONSIDERATIONS.

By J. W. Hume Williams, London.

CHAPTER I.

Legal and Medical Views Examined, ... 559

CHAPTER II.

Monomania, ... 588

CHAPTER III.

Moral Insanity, ... 638

CHAPTER IV.

Impulsive Insanity, ... 668

CHAPTER V.

Further Observations, ... 701

BALDNESS AND GRAYNESS; THEIR ETIOLOGY, PATHOLOGY, AND TREATMENT.

By Tom Robinson, M.D., London.

CHAPTER I.

PAGE
Anatomy of the Hair, ... 727
The Human Skin, ... 727
The Muscles of the Skin, ... 728

CHAPTER II.

Physiology of the Hair, ... 734
Growth and Development, ... 734

CHAPTER III.

Color and Texture of the Hair, ... 743

CHAPTER IV.

Alopecia, ... 752
Alopecia Præcox, ... 756
Alopecia Parasitica, ... 758
Tinea Favosa (Favus), ... 759
Tinea Tonsurans, ... 763
Alopecia Areata, ... 765
Sycosis, Mentagra, Chin-whelk, ... 768
Alopecia Somatica, ... 771
Syphilitic Alopecia, ... 772
Alopecia Follicularis, ... 773
Alopecia Universalis, ... 774

CHAPTER V.

Canities, Pilosis, Grayness or Hoariness of the Hair, . . . 778
Etiology of Canities, ... 778

CHAPTER VI.

Crinal Abnormities, ... 783
Plica Polonica and some other Affections of the Hair, . . 783
Expansions, Splitting of the Hairs, ... 783
Feather Disease, or Phagmesis of the Hair, ... 784
Ringed Hairs, ... 785
Cosmetics, ... 785
Hairdressers and Barbers of the Ancients, ... 786
Hair Cosmetics, ... 787
Rules for the General Management of the Hair, . . . 790

CHAPTER VII.

Treatment, ... 792

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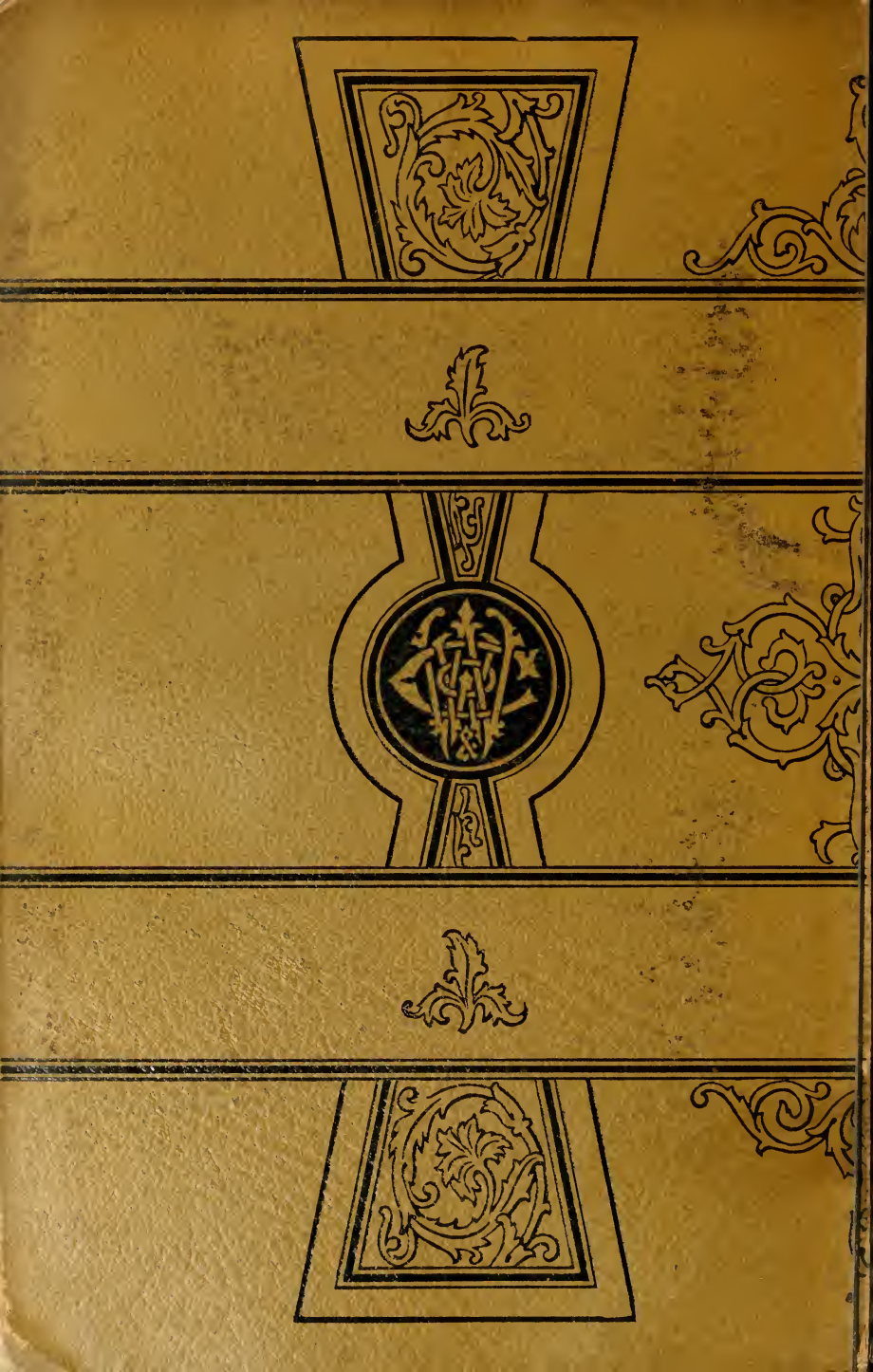
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